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THE TREATMENT OF SOME CASES OF SO-CALLED "PERNICIOUS" ANEMIA

A REGIMEN THAT HAS BEEN FOUND HELPFUL *

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"Pernicious anemia," so called, formerly often overlooked, is now generally recognized, when encountered, by physicians who have been trained in the modern methods of examining the blood. Indeed, once the anemia is well developed, the appearance of the patient is so characteristic that its existence is likely to be suspected at first sight before any examination of the blood has been made. In the office of a consulting physician, where these patients are often entering, it is by no means uncommon to have an observant office secretary, who has grown familiar with the pallor, the lemon-yellow tint to the skin, the weakness and the dyspnea, remark that "the patient coming in looks as though he had pernicious anemia."

Though it is easy to place a patient of this sort in a great group designated "pernicious anemia," we know now that this group does not represent a unity. And, of late, we have learned to divide the general group into several subgroups, our classifications being based partly on the blood findings, partly on etiologic considerations. Formerly, it was common to speak of pernicious anemia as a primary or idiopathic anemia, to distinguish it from a secondary anemia due to disease of some organ, to hemorrhage, or to some other known etiologic factor. The terms "primary" and "secondary" anemia are still used, though we now realize that, in the last analysis, there can be no such thing as a strictly "primary" anemia. Again, Ehrlich's attempt to separate pernicious anemia from other anemias on the basis that the regenerative forms of red corpuscles found in the blood are of embryonal rather than of postembryonal type (megaloblasts rather than normoblasts) broke down when it was found that this criterion, though a helpful one, does not admit of strict application. Though no basis of classification of the severe anemias is as yet wholly satisfactory, a separation of those due to increased blood destruction (the hemolytic anemias) from those due to loss of blood by hemorrhage and from those due to defective or decreased blood formation has been found helpful. The old group of so-called "pernicious anemias" contained subgroups belonging to at least two of these categories. Thus formerly the severe hemolytic anemias and the aplastic, or aregeneratory, anemias were lumped together in the pernicious group. By far the majority of cases that were designated pernicious anemia were, however, hemolytic anemias due to increased blood destruction; only a few of them were aplastic anemias due to decreased blood formation. And the matter was further complicated when it was discovered that a hemolytic anemia may sometimes, after exhaustion of the regenerative power of the bone marrow, enter into an aplastic stage. And, finally, an analysis of the severe hemolytic anemias themselves showed that they, in turn, are divisible into further subgroups depending on their etiology. Among these subgroups may be mentioned (1) the hemolytic anemia due to invasion of the intestine by *Dibothriocephalus latus;* (2) the hemolytic anemias due to syphilis, to carcinoma, and to intoxications in the puerperium; (3) the hemolytic anemias due to certain known chemical poisons, as potassium chlorate, nitrobenzene and phenylhydrazin, and (4) the hemolytic anemia that accompanies congenital hemolytic icterus. But after these subgroups had been recognized, it was found that the majority of severe chronic hemolytic anemias still remained unaccounted for, and it has been, and still is, customary to refer to these cases of unknown (or at least unsettled) etiology as "Addisonian anemia," or "Biermer's anemia," or as the "Addison-Biermer type of pernicious anemia."

Without further introduction, we may say that it is the last group of severe hemolytic anemias mentioned, and to it only, to which we shall refer in the present paper. We must agree with William Hunter and other writers who deprecate the use of the ill defined term pernicious anemia, unless, when it is made use of as a designation, the clinical description is such that the reader will have no doubt as to just what the writer means by it. Since the blood picture in the Addison-Biermer type of anemia is indistinguishable from the blood picture of the forms of hemolytic anemia of known etiology, some of which are curable, it is conceivable that still other groups will be separated out from the Addison-Biermer group as soon as their cause has been discovered. Or it may even be that the cases now remaining in the Addison-Biermer group will later be proved to have a single cause (focal infection? enterogenous intoxication?). The disease we are referring to has been so fully described in modern textbooks[1] that no extended account need

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* Owing to lack of space this article has been abbreviated in THE JOURNAL by omission of some of the case reports. The complete paper appears in the Transactions of the Section and in the author's reprints.

1. Cabot, Osler and McCrae: Modern Medicine, Ed. 2, 1915. Barker: Chronic Hemolytic Anemia of Unknown Etiology, Clinical Diagnosis of Internal Diseases, 1916.

here be given. It will suffice to recall that (1) it is commonest in people of middle age; (2) the well to do are affected almost as often as the poor; (3) men and women are affected in approximately equal numbers; (4) the onset is, as a rule, insidious, the patients complaining of weakness without apparent cause, of increasing pallor (with straw-colored tint to the skin), of dyspnea, of gastro-intestinal disturbances, and of nervous symptoms; (5) the urine is usually high colored and contains an increased amount of urobilin; (6) there is always gastric anacidity, and (7) the blood changes characteristic of a hemolytic anemia are demonstrable (reduced red count; anisocytosis; poikilocytosis; high color index; often regeneration signs, including nucleated red cells, polychromasic red cells and basophilic stippling; moderate leukopenia with relative lymphocytic increase, and a diminished number of platelets). There is often a little fever, but not always. Numbness and tingling in the hands or feet are not uncommon; in the later stages, the anesthesias, paralyses or ataxias due to the lesions in the spinal cord described by Frank Billings and others may be encountered. Pyorrhea alveolaris, peridental abscesses or other signs of oral sepsis may be present. Remissions in the course of the disease are common. They may occur spontaneously; more often, they follow, and seem to be produced by the application of one or another form of therapy. When a remission occurs, the patient may remain well for months, or even for years. Several exacerbations, separated by remissions, may be encountered in a single patient. Clinical experience teaches us to be very guarded regarding prognosis, for in the majority of cases, sooner or later, a relapse occurs that does not yield to treatment, but goes on to a fatal termination.

UNSATISFACTORY STATE OF PREVIOUS PLANS OF THERAPY

The bibliography of the subject contains great numbers of reports on the various methods that have been used in the treatment of pernicious anemia, and certain of these methods have been, and still are, warmly advocated by their adherents. Their very multiplicity is evidence that in none of them has, as yet, a really satisfactory plan of therapy been found. Indeed, until the etiology and the pathogenesis of the Addison-Biermer type of anemia are better understood, and until more is known of the mechanisms of pathologic hemolysis and of regenerative hematopoiesis, an intirely satisfactory method, applicable in all cases, need scarcely be expected.

Among the forms of therapy that are most in vogue may be mentioned (1) dietetic-hygienic measures; (2) pharmacotherapy (iron, arsenic, quinin, hypophosphites, cholesterin, glycerin, oxygen inhalations, hydrochloric acid, intestinal antiseptics, salt infusions), radium, thorium and the roentgen ray; (3) subcutaneous or intravenous injections of whole or of defibrinated blood; (4) the combating of oral, gastric and intestinal sepsis, and (5) splenectomy.

William Hunter did a great service in emphasizing the importance of not being content with the application of single measures in the treatment of addisonian anemia, urging a "general management of the case, with close observation of all its features, especially of its gastric and intestinal symptoms, of its fever, and of its hemolytic symptoms, extending not merely over the period of acute illness, but also over many months and years subsequent to the first remission."

In this paper we wish to make no extravagant claims for the methods we have employed, but desire simply to set forth a general regimen that, during the past few years, has, when it has been systematically applied, yielded favorable results in at least one group of cases of anemia of the Addison-Biermer type. We say "one group of cases," for we have had other cases that have not responded favorably to the regimen. Why the one set of cases responded whereas another set did not, we do not know. Thus far, we have been unable satisfactorily to differentiate between the two classes of cases before the therapy has been applied.

REGIMEN USED BY THE AUTHORS

1. *The Diagnostic Study.*—When an anemia of the Addison-Biermer type is suspected, the patient is sent at once into a *private room in the hospital,* where the physical examinations and laboratory tests are made with the least possible discomfort to the patient and with avoidance of exertion on his part. If the anemia is severe, we ask the patient to give himself over to us entirely for a time, gaining his *consent to forego both letters and visits,* even from members of his family, for a time. He is required to remain in bed, undressed, constantly, the *rest in bed* being made as nearly absolute as possible, aside from the interruptions necessitated during the first week by the application of diagnostic methods. An experienced *special nurse* is secured whose sole duties consist in administering to the care and comfort of the patient, tactfully securing observance of all directions issuing from the physicians.

After the anamnesis has been recorded, and the general physical examination of the different systems made, the blood, gastric juice, feces and urine are carefully studied and a thorough *search for focal infections* is undertaken. In this search, the special domains of the body known to be prone to focal infection are closely examined, whenever possible by men who devote their whole attention to particular fields. Thus the teeth and gums are inspected by a consulting dentist, expert in oral diagnosis; the extent of any pyorrhea present is reported; roentgenograms of dead teeth are made and the films closely examined for periapical areas of resorption and for paradental infection. Glossitis, or stomatitis, if present, is carefully noted. A nose and throat specialist is asked to report on the condition of the nose, throat, ears and paranasal sinuses as revealed by direct inspection and by transillumination. In addition, roentgenograms of the paranasal sinuses by the method of Waters and Waldron are made in every case as a supplement to, and control of, the rhinologist's examination. The digestive tract, already studied by physical and chemical methods, is further examined by roentgenoscopy (after barium intake), and if there is any suspicion of ulcer, of appendicitis, of cholecystitis, of ileal or cecal stasis, or of diverticulitis, serial roentgenograms are also made. The urogenital tract is subjected to special examinations also, urethritis, cystitis and pyelitis being sought for in both sexes, in addition to a search for prostatitis and seminal vesiculitis in the male, and for vaginitis, cervicitis, endometritis and pelvic inflammatory disease in the female.

2. *Surgical Treatment.*—In case focal infection is found, even though it appears to be trivial, we usually attempt to eradicate it, for in our experience it pays in the severe anemias, just as in the arthritides, to be radical rather than conservative in the treatment of any infection found.

In the mouth, stomatitis and glossitis receive appropriate local applications; infected teeth are extracted and the sockets are curetted and treated for a few days with iodin solution; gingivitis and pyorrhea alveolaris are treated by a pyorrhea specialist. Any teeth loosened by pyorrhea are extracted. Pyorrheal pockets are carefully curetted and locally treated. After the mouth has been put in good condition, the patient is instructed in the details of a proper mouth toilet, the nurse seeing to it that the technic is acquired and regularly applied.

In the nose, throat and ear, any active infection found is treated at once. For example, a suppurating sinus (antrum, ethmoid, etc.) will be drained; infected adenoids or badly infected tonsils will be removed, though great care should be taken not to subject the patient to an operation on the tonsils merely because they are adherent, or because tonsillitis has previously existed. Here the common sense of the physician in charge may often be required to check the *cacoethes secandi* of an overzealous specialist. Similarly, the best judgment of the physician will be called on in deciding for or against operation for suspected infection elsewhere (gallbladder, appendix, renal pelvis, endometrium, etc.).

In our experience, infections of the teeth and gums have more often than any other infection required immediate attention in pernicious anemia. Rapid improvement has so frequently followed the treatment of such oral sepsis that we cannot help but feel, with William Hunter, that this side of the treatment is, in many cases, very important, and that poisoning from oral sepsis may, in some cases at least, play an etiologic rôle.

It is surprising how well patients with severe hemolytic anemia bear the operations necessary for the removal of foci of infection. At first we were loath to permit even minor surgical operations on these patients, but after a few trials we became convinced that our reluctance had been unfounded. Even with a red corpuscle count as low as 1,500,000 and a hemoglobin of 30 per cent., the patients stand, without harm, a short general anesthesia for extraction of teeth, or for such a procedure as the puncture and cleaning of an infected antrum. It has been rare, too, to see any unusual bleeding follow these minor surgical measures. Should any major operation be indicated, it is best deferred, unless very urgent, until a decided improvement in the condition of the blood has been obtained. Thus one of our patients, who suffered from a cystitis, due to leading a catheter life because of prostatic hypertrophy, came in with a hemoglobin percentage of 38 and a red corpuscle count of 1,400,000. He had several infected teeth, which were removed at once. The blood rapidly improved, and when the hemoglobin had reached 80 per cent., we asked Dr. Young to remove the prostate. The patient bore the operation perfectly well, the cystitis soon cleared up, and he has remained well since.

3. *Dietetic Treatment.*—We believe that attention to the diet of the patient is especially important. Gastrointestinal disturbances are so common in the disease that they have come to be looked on as more or less characteristic of the symptomatology. Owing to the gastric anacidity there is hypermotility of the stomach, too rapid emptying of that viscus, and frequently diarrhea. The disinfectant properties of the gastric juice are lost, owing to the absence of hydrochloric acid, and abnormal fermentative processes doubtless occur. Eructations, meteorism and general abdominal discomfort are common, and there are sometimes critical exacerbations of these abdominal disturbances. Anorexia is a prominent symptom, and nausea and vomiting are frequently present. It is but little wonder that, as a result of all these conditions, the patients, either on their own initiative, or at the advice of physicians, make attempts to modify their diet so as to secure relief from symptoms. As is well known, these symptoms tend to persist for a time, no matter what kind or quantity of food is ingested. We find that most of the patients that have come to us have reduced their food intake quantitatively far below their needs, and that nearly all are on a qualitatively ill-balanced diet. Moreover, though they may be perfectly willing to rest, their aversion for food and their fear of what may follow eating often make them quite unwilling, and at first even unable, to eat. For this reason, it is our custom to begin, in the severer cases, with the milk diet of Dubois; on the first day we give 2½ ounces of milk every two hours from 7 a. m. to 9 p. m., the two hourly quantity being increased each day until by the sixth day the patient is receiving some 3 liters (quarts).

On the seventh day, we permit a small piece of bread and a little jam at breakfast time, and at midday we send in a full tray of easily digestible foods. From the beginning, the patient is encouraged to drink all the milk brought to him, regardless of any disinclination he may feel, or of any consequences that may follow it, and the special nurse tactfully but firmly sees that he takes it. Even if there is some vomiting, the milk is given again at the regular times. The same system is followed after the milk diet has been succeeded on the seventh day by a full and varied diet. The patient is encouraged to eat regardless of choice or of inclination, and to empty each dish on the tray. At first the portions sent are not too large, but during the next few days they are rapidly increased in size until the patient is on an abundant roborant diet, rich in protein, and, if he is thin, in carbohydrate and fat also. At this time, too, the patient is asked to swallow a raw egg (with a little orange juice) immediately after each of the three meals. A little later on, two raw eggs after each meal may be given. In our experience, most patients find it easier, when taking three large meals, to swallow the raw eggs immediately after the meals rather than to take them as "intermediate nourishment." Extra milk, too, is given, as far as possible, with meals, rather than between them. Many patients may, within two or three weeks, be induced to take six raw eggs, a quart and a half of milk and a pint of cream, each day, in addition to three full meals. In this way, the daily dietary of the thin patient may easily reach an intake of 4,000 or 5,000 calories. After the first period is over and some gain in strength has been made, an intelligent patient may often be helped, if eating is still hard for him, by giving him a book like Locke's "Food Values," and asking him to figure out, with the aid of the nurse, the number of calories in the diet ingested and to keep a food chart recording the intake of protein, carbohydrate and fat. Interest is soon aroused in securing a gain in weight, as well as in the rising red corpuscle curve and hemoglobin curve after these begin to show improvement. Not a few anemic patients are overweight, and when such obesity exists, we make sure of a large intake of proteins (meat, eggs), green vegetables in purée form, and stewed fruits, keeping the intake of carbohydrates and

fats low, in such instances, so that the total caloric intake does not exceed 1,000 or 1,500 calories per day.

The dietetic treatment can be materially aided, also, by measures taken to improve the appetite and to overcome the oral, gastric and intestinal disturbances (see pharmacotherapy).

4. *Fresh Air.*—The windows of the patient's room are kept constantly wide open, though care is taken to insure his warmth in bed. After the diagnostic study has been completed and any preliminary surgical therapy has been got through with, the patient's bed is wheeled out on a porch, where he spends a large part of each day (preferably in the sunshine); in some cases, the patient is encouraged to spend the whole night in the open air, carefully protected from cold.

5. *Pharmacotherapy.*—This plays a subordinate but, in our opinion, a very helpful part in the treatment of a severe anemia. Above all, pharmacotherapy can be a great aid to digestion in patients who suffer from pernicious anemia. On account of the gastric anacidity, we give from 20 to 30 drops of dilute hydrochloric acid (with or without pepsin) with each meal, and the same dose is repeated about half an hour after the meal. Croftan has used even larger doses and, he believes, with good results. In addition, it is our custom to give 45 grains of pancreatin with 45 grains of calcium carbonate three hours after each meal. In view of the fact that hydrochloric acid is absent from the stomach juice and that the pancreatin is further protected by the alkaline calcium carbonate that is given with it, it seems reasonable to assume that much of the pancreatin may pass through the stomach uninjured and reach the intestine in a form capable of aiding in intestinal digestion. Certain it is that many of our patients on this regimen quickly become able to eat large amounts of food, making but few complaints of abdominal discomfort. We regard the hydrochloric acid treatment, however, as much more important than the treatment with pancreatin and calcium carbonate; and when patients, as some will, complain of finding the swallowing of the pancreatin disagreeable, we omit this part of the treatment.

A bitter tonic—say 10 minims of tincture of nux vomica in 1 dram of compound tincture of gentian—given ten or fifteen minutes before each meal may do something toward improving the appetite, though the hydrochloric acid treatment alone, along with the encouraging psychotherapy, is usually followed by a sufficient food intake. The digestive disturbances often clear up in a remarkable way after the measures described have been applied. If they do not, one must keep a close watch for the development of signs of an underlying malignant disease, for, as is well known, a carcinoma of the stomach may for a time masquerade as a pernicious anemia.

Medical tradition as regards the beneficial effects of arsenic in the treatment of these patients we believe to be well founded, and we have used it in every case. Formerly, we used either liquor potassii arsenitis (Fowler's solution) or pills of arsenous oxid and pepper (Asiatic pills[2]), but of late we have given the arsenic in the form of sodium cacodylate, by intramuscular injection. It has seemed to us best to use rather small doses. We give only 50 mg. per dose, once daily for eight days; after an interval of two weeks, a second course of eight injections is given. This does not upset digestion, whereas Fowler's solution sometimes irritates the digestive tract. In a few cases, we have used small intravenous injections of salvarsan (0.3 gm.), and with Byron Bramwell and with T. R. Boggs have felt that it had a good effect; as a routine mode of giving arsenic to these patients, however, we adhere to the intramuscular injection of sodium cacodylate.

6. *Massage; Exercise.*—As we have said, we keep the patients at the beginning of treatment at as nearly absolute rest as possible. This is especially important, if the hemoglobin percentage is very low. A little gentle massage may, however, be started early in the treatment, its amount and force being increased gradually as the patient's condition improves. We usually order it, as a routine measure, to be given three times a week, taking the precaution to engage the services of operators who have been well trained and who have shown, earlier, good judgment in estimating the quantity and quality of massage beneficial at different stages of severe illnesses. The massage is continued as long as the patient is confined to bed.

The patient is not permitted to exercise, even in bed, until the hemoglobin is above 60 per cent.; after that, however, he is instructed in gentle resisting exercises to be taken in bed. The exercises described in S. Bennett's "Old Age: Its Causes and Prevention," are excellent for this purpose. It is a pity that Bennett's book, aside from the description of the exercises, contains much arrant nonsense and misleading advice; if placed in the hands of patients, they should be warned to pay attention in it to nothing but the exercises.

Rest in bed is maintained until the hemoglobin percentage is above 80 and the red corpuscle count above 4,000,000. Toward the end of this period, the patient is allowed to sit up in bed with a back-rest and to occupy himself with reading and with other mild diversions. He is then permitted to sit up in a chair, for one hour on the first day, for two hours on the second and for three hours on the third day. On the fourth or fifth day he is allowed to walk for five minutes. The exercise is then gradually increased until one or two hours of gentle exercise are taken in the open air daily. When the patient leaves the hospital, he is warned of the danger of relapse, is cautioned against excess in mental or physical exertion, and is advised to have his family physician keep a close eye on him even after apparently complete recovery. He is urged to keep up the hydrochloric acid treatment continuously, for the gastric anacidity probably always persists, and he is warned especially against deviating from the well-balanced dietary, arranged in caloric intake according to his needs.

7. *Other Measures, Including Blood Transfusion and Splenectomy.*—In the one group of cases to which we refer, we have usually had a favorable response with no therapy other than the measures outlined above. Some of the patients showed immediate and rapid improvement. A larger number began to show improvement in the blood findings only after two or three weeks of treatment. In many cases, the red count rose to 4,000,000 and the hemoglobin to 80 per cent. within eight or ten weeks. In some cases improvement began only after patient persistence with the regimen for a much longer period. In the group of patients that did not respond at all to this treatment, the blood picture remained unaltered, or grew worse.

2. Asiatic (Tanjore) pills are compounded of arsenous oxid, 5 grains; powdered black pepper, 10 grains; powdered acacia, 3 grains; water, enough to make a mass, divided into twelve pills.

Only after the regimen outlined had been given a thorough trial without benefit did we think it worth while to resort to other measures (transfusions, splenectomy). One exception to this rule has been made: when the red corpuscle count is below 1 million and the hemoglobin percentage below 20 when

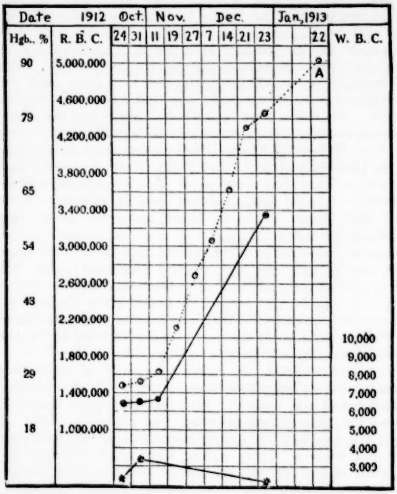

Chart 1.—The blood in Case 1: *A*, reported by home physician. In this and the accompanying charts, the solid line with solid dots denotes red blood corpuscles; the dotted line with hollow dots, hemoglobin, and the solid line with stars, white blood corpuscles.

the patient is first seen, we have found transfusions very useful in raising the blood to a higher level before starting on our usual regimen. When blood transfusions are used, we take especial care to find a suitable donor (negative Wassermann reaction; same group as regards agglutinins and hemolysins).

ILLUSTRATIVE CASES

As examples of favorable response to the method of treatment employed, a few case summaries with blood charts are given. These patients, except in Case 7, are now very well. They all know of the danger of relapse; they are living carefully regulated lives and are having occasional blood examinations made. Patient 7 made a good start, but had a marked setback with fever. Unfortunately, he could not remain at the hospital, but is now trying to gain a remission at his home in a distant state.

CASE 1.—*History.*—C. L. M., business man, aged 45, married, admitted, Oct. 24, 1912, discharged, Dec. 23, 1912, complained of indigestion, constipation and "liver trouble." The diagnosis was pernicious anemia, gastric anacidity and oral sepsis. The family history was good. Seven brothers were all well except one, who had had a similar trouble.[3] The patient had had measles, whooping cough and mumps in childhood; pneumonia at 17; tonsillitis at 43; chronic catarrh for twenty years, and otitis media at 30. He was accustomed to three or four colds each year. He had had abdominal pain, coming on occasionally at night, during the past five years; it was relieved by a drink of water. Constipation had been present for three or four years, and hemorrhoids for two years. The patient's habits were good. The onset occurred in November, 1911, one year before admission, with asthenia. The patient stopped work in April, 1912. Other symptoms were loss of weight, anorexia, constipation, and numbness of fingers. Three months before, vomiting spells occurred, with nausea but without pain. His physician said that in August, there was an acute attack with fever, jaundice, choluria, acholic stools, nausea and vomiting, very suggestive of cholangeitis. He had had reverses in business, and was depressed and introspective.

Physical Examination.—The patient was undernourished. There was bronze pigmentation of the skin, and pallor of the mucous membranes; the tongue was flabby and of a brownish color. There were some infected dental roots and a few palpable cervical lymph nodes. The heart and lungs were negative. The liver edge was palpable, two fingers breadths below the costal margin. Slight resistance was encountered in the gallbladder region. There was slight edema of the ankles; a few external hemorrhoids were noted.

The blood picture was that of a severe anemia (Chart 1). There was gastric anacidity. The stools were normal. The Wassermann test was negative. The Calmette reactions were negative.

The only untoward event in his otherwise favorable course was an acute febrile period of four or five hours' duration, with temperature of 102 F., chilly sensations, and nasal discharge. About a month after his discharge from the hospital, his physician, Dr. James A. Work, Jr., wrote that his hemoglobin was 94 per cent. (Gowers). The patient was then feeling well, and was at work. While in the hospital, his systolic blood pressure was about 100; his temperature rose occasionally to 99.5, but usually was not over 99, with a tachycardia of from 90 to 100. Weight increased in the hospital from 120 to 140 pounds.

Treatment.—This consisted of rest, full diet, dilute hydrochloric acid (twentieth normal) before and after meals; arsenic in the form of sodium cacodylate; neosalvarsan (one dose); and, for a time, liquor potassii arsenitis. Blaud's

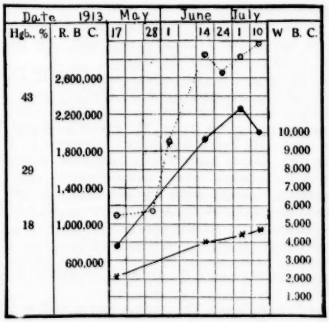

Chart 2.—The blood in Case 2.

pills were given after meals. A solution of potassium chlorate was used as a mouth wash. The teeth and gums were put in good condition.

This patient, who lives in Indiana, has returned from time to time for observation. He is well and carries on an active business. His hemoglobin has, at times, been as high as 107 per cent.

CASE 2.—*History.*—W. C., business man, aged 38, admitted, May 17, 1913, discharged, July 10, 1913, for about eight years, had had a low fever at times accompanied by chilly sensa-

3. This brother, J. H. M., aged 53, came into the hospital the following spring, March 17. He had had bad teeth for eighteen years, typical symptoms of pernicious anemia for nine months, gastric anacidity, blood count of 1,000,000 red blood corpuscles, fever and tachycardia. His course was progressively downward and he died, April 30, in spite of salvarsan, of whole blood subcutaneously, and of a transfusion of 500 c.c. of defibrinated blood.

tions; the disease had been supposed to be malaria, though the symptoms were much like those manifested on admission. He had been troubled with bad teeth for many years. The present illness had grown worse for four months, with loss of weight, marked asthenia, fever, and tachycardia. On admission to the hospital, several teeth were found to be loose, with pus about their roots. The physical findings and

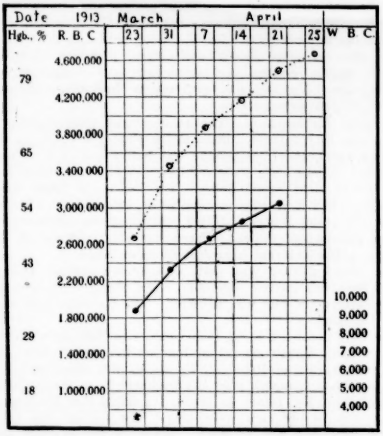

Chart 3.—The blood in Case 3.

blood picture were typical of pernicious anemia of severe grade. The red corpuscle count was below a million cells; hemoglobin 20 per cent. (Chart 2).

Treatment.—This consisted of rest, food, hydrochloric acid, Blaud's pills, and arsenic in the form of sodium cacodylate; neosalvarsan, two doses; and for a time, liquor potassii arsenitis. The teeth and gums were put in good condition by dental specialists.

Note on Discharge.—The symptoms have all cleared up; the patient has gained 12 pounds in weight; the pallor is gone; the blood is rapidly improving.

CASE 3.—*History.*—J. C. L., business man, aged 37, admitted, March 21, 1913, discharged, April 25, 1913, complained of a "general tired feeling," nervousness and sleeplessness. The family history was unimportant. The patient's general health had been good. He had had measles and mumps as a child, and gonorrhea, twenty years before admission, followed by stricture of the urethra, which was completely cured. He had a tendency to worry about business affairs, became very irritable at times, and suffered from insomnia. He had meals at irregular times, ate rapidly and, formerly, smoked excessively. The onset began about thirteen months before, following an attack of grip. He did not go to bed, but kept at work, with progressive increase in the asthenia, irritability, insomnia and anorexia.

Physical Examination.—The patient was a well-nourished, muscular man. His face showed marked pallor. The liver edge was palpable 1 cm. below the costal margin. The firm, round edge of the spleen was felt just beneath the costal margin. The blood examination disclosed a moderately severe anemia, with high color-index and leukopenia, as shown in Chart 3. There was gastric anacidity. The Wassermann test was negative. The diagnosis was pernicious anemia and gastric anacidity.

Treatment.—This consisted of rest, full diet, hydrochloric acid, calcium carbonate and pancreatin, 3 drams of each, three hours after each meal, and sodium cacodylate.

At time of discharge, April 25, the spleen was not palpable. At first, there was an occasional rise of temperature to 99.6 F. There was no fever during the last three weeks. He gained only a few pounds in weight while in the hospital. Later, at a nursing home, he made a good gain in weight. On leaving there, he went to the country to live. His blood is now normal and he is taking up his work again in Alabama.

CASE 4.—*History.*—A. E. H., man, aged 43, white, married, admitted, May 18, 1916, and discharged, July 30, 1916, complained of sensitiveness of the plantar surfaces of the feet, and of weakness. The family history was good. He has three children, living and well, and no children have died. The patient has worked hard at confining office work, but his health has been, in general, good. He has had the usual children's diseases. He had influenza four years ago, but has had no sore throat. He has had alveolar abscesses recently. His habits have been good. Patient said his illness began about nine months previously with numbness in hands and, later, in feet and knees. The numbness had disappeared, but he said the toes and the bottoms of his feet were very sensitive. There had been some loss of weight. Blood examined at home had disclosed marked anemia. Three small transfusions of whole blood had been given, each containing from 30 to 50 c.c.

Physical Examination.—The patient was fairly well nourished, though pale and with slightly pigmented skin. The scleras were slightly icteroid. The heart was negative except for a soft systolic murmur. The lungs, the spine and the abdomen were negative. There was definite hyperesthesia on the plantar surfaces of the feet. There were no other evidences of lesion of the nervous system.

The blood revealed the usual picture of a moderately severe pernicious anemia as seen in Chart 4. The Wassermann reaction was negative. The roentgenoscopic examination of the gastro-intestinal tract was negative. After an Ewald test meal nothing was recovered through the tube after thirty-five minutes. There was no fever and no tachycardia. The urine was of low specific gravity, and otherwise normal. Dental consultation and examination revealed periapical areas about three teeth, and these teeth were extracted and

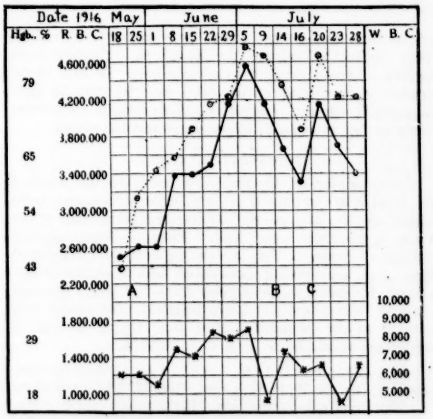

Chart 4.—The blood in Case 4: *A*, three teeth extracted; *B*, diarrhea and abdominal pain; *C*, diarrhea checked.

their sockets curetted. The diagnosis was pernicious anemia and oral sepsis.

Our usual regimen for the treatment of pernicious anemia was begun. Improvement began at once, but, after eight weeks, was interrupted by an attack including diarrhea and abdominal pain. After a few days, however, the counts again started upward. Recent reports from his home in Texas state that the patient is very well.

CASE 6.—*History.*—S. B. F., aged 73, business man, married, was admitted, April 27, 1917, and on examination pernicious anemia and peridental abscesses were revealed. The patient complained of weakness, loss of energy, pallor, dyspnea, and anorexia. He had had one attack of diarrhea. The family history was negative. The patient had had measles, mumps, chickenpox and malaria. He has had a great deal of trouble with his teeth (pain, abscesses). He had an attack of influenza three years ago with bronchitis. He has some frequency of urination, and is unable to empty his bladder. His habits are good. For three years, he had felt loss of his usual energy, and had had vague abdominal discomfort, constipation and anorexia. The weakness had increased steadily and, for one year, had been quite marked. The other symptoms noticed include dizziness, loss of weight, and dyspnea on exertion.

Physical Examination.—The patient showed moderate obesity; had a typical lemon-yellow color of skin and scleras; marked pallor and spade-like hands with abundant soft parts, almost like myxedema. There was severe oral sepsis and tachycardia. A slight pitting of ankles and a slight arterial hypertension were noted. The blood pressure was 150/80.

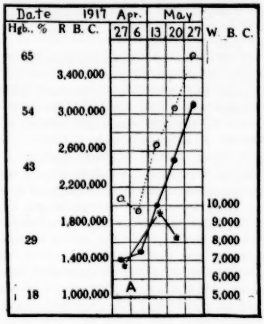

Chart 6.—The blood in Case 6: *A*, extraction of ten teeth, May 4, 1917.

Blood examination revealed a marked anemia as seen in Chart 6. Gastric analysis shows anachlorhydria; total acidity 7 acidity per cent. Stools were small, soft and light yellow, but contained no parasites, ova, or blood. The Wassermann reaction was negative. Dental consultation and examination revealed large periapical areas with pus-sacs about many of the teeth, some ten of which were accordingly extracted.

Roentgenographic examination of the stomach and the intestines disclosed a spastic pylorus and a duodenal cap rotated and flattened out, suggesting a lesion in the neighborhood of the gallbladder. The laryngologic examination was negative. The urologic examination revealed phimosis, chronic prostatitis, and seminal vesiculitis. Further cystoscopic examination will be made when the patient's strength permits. The urine is of normal amount. The specific gravity is 1.015, and there is a faint trace of albumin, hyaline and granular casts, and abnormal amounts of urobilin.

The patient was at first extremely asthenic, and dyspneic on the slightest exertion. These symptoms improved markedly along with improvement in the blood condition. The usual regimen was followed. The chart shows the beginning of an improvement that has continued steadily since. The patient returned to his home in Delaware.[4]

ABSTRACT OF DISCUSSION

DR. H. A. CHRISTIAN, Boston: Forced feeding is evidently important, but in our own experience often we have found it exceedingly difficult to carry out because so many patients have nausea or a distinct aversion to food. In overcoming that aversion to food we have sometimes found transfusion valuable. I would suggest transfusion as an appetizer in some of these cases of pernicious anemia. In regard to the treatment with hydrochloric acid, pancreatin and calcium carbonate, we have found great difficulty in getting our patients to take this treatment (on account of the bad taste, especially of pancreatin). We have carried it out as Dr. Barker has suggested, and some patients have taken it very well; other patients have refused. There may be something wrong with our pancreatin, or we lack that persuasive power that Dr. Barker has.

Clearing up foci of infection of course is important. The prolonged rest, with the patient going frequently out into the fresh air or spending the whole day in the open, adds a great deal to the results because the patients take their food so much better, and their general condition is greatly improved. Frankly, however, I do not think we have succeeded in accomplishing much in the attempt, possibly a poor attempt, to carry out the regimen that Dr. Barker has indicated. In some cases we have had good results and in others we have had no results at all.

I should like to emphasize the importance of gastric anacidity in these cases. The point is that sometimes the condition exists for several years before the development of the symptoms of anemia. I have seen a case in which it existed for five years and in one of our cases, which was studied very thoroughly, with a complete blood examination and nothing abnormal made out except gastric anacidity, the patient returned in two years with typical primary anemia. I should like to emphasize the presence of fever as a symptom. As we see it in the hospital, we find fever present with almost no exceptions; if the patient is sick enough to come to the hospital, he almost invariably has fever. These cases have been sent in as typhoid fever and tuberculosis because the general practitioner did not recognize the fever as a symptom of anemia. In these cases transfusion, when it increases the blood, relieves the fever.

DR. N. E. BRILL, New York: I know of no subject in the domain of the pathology of the blood which is surrounded by as much darkness as is the subject of anemia, whether primary or secondary. This is perhaps due to the fact that we as clinicians have not paid much attention to the biologic, physiologic and pathologic conditions associated with anemia. We speak of anemias in a general way as reduction in the number of the red cells of the blood. When we take into consideration the fact that the spleen is constantly destroying blood cells, that the life of a red blood cell, as estimated by Quincke is only thirty days, that therefore of all our blood we are losing one-thirtieth every day, it must strike us that there must be a nice balance between this daily loss and the new red cells formed to keep a constant of 5,000,000 red blood cells to each cubic millimeter of blood. What is the factor that regulates this wonderful balance? For over ten years I have been teaching my students that the regulating cause of this production resided in the red blood cell itself, particularly in its hemoglobin, and was particularly dependent on the oxygen-carrying capacity of the blood. When there is a diminution of oxygen in the blood, whether it be due to deficiency in the number of red cells or in the available oxygen, that deficiency of oxygen is the instigator or the hormone to the marrow for the production of new red cells. Clinically that theory is borne out by many factors. We know that in deficient aeration of the blood such as occurs in emphysema or in cardiac disease, the bone marrow responds to that diminution of oxygen by producing new cells, and polycythemia is a not uncommon accompaniment. Take carbon monoxid poisoning: there is no poison that will dissipate or force aside the oxygen from the hemoglobin as intensely and completely as will carbon monoxid gas, and in every case of this poisoning reported you will find that the bone marrow was distinctly red and that the circulating blood was full of nucleated cells, which means bone marrow activation. Take the blood of people living up on the mountain tops and you will find that the average number of red cells is 6,000,000 instead of 4,000,000 or 5,000,000, which is the number present at sea level, owing to the diminution of oxygen, the result of variation in barometric pressure. Take pernicious anemia, or even Minkowski's disease, in each of which the hemolysis which accompanies them results in the splitting up of the hemoglobin and, therefore, in the oxygen content, as a result of which bone marrow stimulation obtains. Haldane has shown that the blood in pernicious anemia contains the lowest amount of hemoglobin, hence the

4. In the summer (1917) he wrote that he was well—better than he had been in years.

amount of bone marrow activation is most marked in that disease.

DR. GEORGE R. MINOT, Boston: Dr. George I. Lee and I have studied the anemias at the Massachusetts General Hospital for the past three years, and there is one point about the activity of the bone marrow which was not brought out, yet which seems to us important.

It has been pointed out that the skeined cells (reticulated cells) and polynuclears give us information about bone marrow activity. The blood platelets are formed from the giant cells of the bone marrow and are also important elements to observe when studying bone marrow activity. We feel that if we were given, in a case of pernicious anemia, but one of the three chief marrow elements to judge the activity of the marrow from, we would rather know the number of the platelets than any other single factor.

We have treated approximately 100 patients with pernicious anemia; about 40 of these patients received only fresh air, suitable diet and arsenic; about 40 more have received transfusions, and 19 (chiefly unselected cases) were splenectomized. Splenectomy should, however, be reserved for selected cases, and is to be looked on as only the best means of inducing a remission. It usually gives the most satisfactory results in young patients with large spleens and considerable hemolysis. About 85 per cent. of the splenectomized patients showed some definite improvement following the operation, and 45 per cent. showed marked rapid gains; 50 per cent. of the transfused patients showed definite improvement beyond a simple filling up with blood, and 18 per cent. showed marked rapid gains; while in a similar period of time but 35 to 40 per cent. of the nonsplenectomized and nontransfused patients showed any improvement at all, and 7 per cent. showed marked rapid gains. There was a greater degree of improvement in the transfused and splenectomized than in the other patients.

DR. FRANK SMITHIES, Chicago: I am glad that Dr. Barker emphasized the important causal relationship of bacteria to the severe anemias. I personally believe that in the majority of these cases of addisonian or "pernicious" anemia we have to deal with a peculiar type of bacterium of the hemolytic group. It is probable that the ailment represents end-results of long continued, intermittently active, low-grade sepsis.

In regard to the treatment, I believe in the early and frequently repeated transfusion of undoubted blood. I think that if we knew how to use transfusion, splenectomy would not be necessary in the majority of cases. Does transfusion do anything? Dr. Christian said that it is an appetizer; it certainly is, in the majority of cases. It will aid Dr. Barker in giving these large masses of pancreatin, which of course physiologically have no action within the alimentary tract. Transfusion will enable the patient to fight infection and its products, and probably stimulate blood formation. It will do in a week what Dr. Barker's rest treatment in bed for a month or more will do. This is an important service when one is treating anemic patients whose time and money are both limited. The individual who is energetically treated from the start has a fighting chance. I think that we ought not to go from this room and say, respecting our addisonian anemias, that the treatment is only "lots of fresh air, good food and sunshine, and Heaven help them." If we let the patient consider that he has a hopeless disease, then he will not do well; but if we get into the patient's mind that there is a cause for this disease and that we are treating that cause as far as possible, we are going to have a fighting group of patients with anemias. Many will get well and be useful citizens.

DR. EDWARD LINDEMAN, New York: The most typical feature of pernicious anemia to me is its atypical and capricious course. One must be constantly guarded lest one attribute to any form of therapy that which rightly belongs to the natural course of the disease.

As to the value of the different measures of treatment as advocated in Dr. Barker's paper, I never give hydrochloric acid, cacodylate of soda or other medicinal remedies mentioned. I do not crowd the food, for the simple reason that after transfusions patients crowd the food without advising it. I do not advise rest in bed after transfusions. Patients are given blood transfusions in quantities from 1,200 c.c. to 2,300 c.c. These transfusions are given by the syringe cannula system and no reactions follow transfusions. Under no circumstances is sodium citrate or other anticoagulant used. I do not find it necessary to transfuse more than once in two months, one and two years, or even longer intervals, depending on the type of case.

When one sees a patient in a semiconscious state with dyspnea, generalized edema, persistent nausea and vomiting, rapid pulse and fever, and four hours after receiving 1,600 c.c. of blood, finds a disappearance of all nausea and vomiting, with the return of full consciousness, with absence, at the end of twenty-four hours, of all signs and symptoms enumerated, and the patient remains well for a period of two years, one cannot help but respect that form of therapy.

In regard to splenectomy, every patient I have had has returned with a blood crisis. What splenectomy has done for some is that it has prolonged the remissions of the disease and only carefully selected cases have proved favorable for this procedure.

In all cases of pernicious anemia coming under my observation in which the patients were in the first year of their disease, and who have remained where I could treat them at opportune times, there has been no death in the last two years. Treatment consisted almost entirely of blood transfusions in large amounts.

DR. E. L. TUOHY, Duluth, Minn.: I wish to emphasize the value of Schneider's method of estimating pigment output in the duodenal contents. The original investigations of Eppinger and Hess were made on the stools. Splenectomy, as advised by Eppinger, was the outgrowth of this work. Whatever may prove ultimately to be the merits or demerits of this operation, it can be said that certainly splenectomy is not logical in those patients not showing pleiochromia in the duodenal contents. I have studied about thirty cases of severe anemia, using this method in addition to the usual methods of investigation. Interestingly, two cases of *Bothriocephalus latus*, with very severe anemia, did not show any excess of pigment in the duodenal contents. In many severe anemias where I live the patients have shown positive Wassermanns; all of these have shown the same sort of duodenal contents as are seen in the usual severe secondary anemia. All have improved under specific treatment. The true pathology of pernicious anemia still seems obscure. The spleen cannot be looked on as the only destructive agent. These severe syphilitic anemias point to the possibility of striking injury done the bone marrow by syphilitic toxin.

DR. ALFONSO CASTELLI, New York: In the treatment of secondary anemia, exercise, diet, rest, fresh air and transfusion, of course, give relief, but in my experience in the treatment of secondary anemia the best results have been accomplished by the intramuscular injection of arsenate of iron. Iron, we know, is the time honored drug in the treatment of anemia, and we can trace its use to those early, empiric times when it was obtained for medicinal purposes, from having a red hot piece of iron immersed in water so as to produce aqua ferrata or chalybeate. We also know that iron, which enters into the constitution of the human body, 2.1 gm. being present in the average 65 kg. body, makes hematoblasts become adult erythrocytes, thus entering into the formation of hemoglobin, which is the important functional element in the red cells and the most important medium in the exchange of oxygen (oxyhemoglobin) from the air to all the tissues.

Arsenic, the well known tonic and alterative, on the other side, seems directly to stimulate bone marrow and the other hematoplastic organs in their blood-cell producing function, and therefore in the combination of the two elements, iron and arsenic, we have an ideal product with which to treat anemia. Of course, we know that iron must not be given by mouth, because patients will get either diarrhea or constipation, and we know that the intestines do not absorb heavy metals like iron, to say nothing of its teeth-blackening property. Likewise, arsenic tends to show untoward effects—nausea, dyspepsia, gastralgia, etc.—when administered by mouth, while the administration by the transcutaneous route of the two elements in solution avoids all that trouble and gives, beside, a fair estimation of the dose of the compound

which is deemed advisable to inject, according to age, size, etc., of the patient. We may start with 0.1 gm. of iron arsenate in 1 c.c. of solution, to be administered every day or every other day, children and undersized patients accordingly, and the dose may be increased up to 0.7 gm. After a number of injections of this arsenated iron the blood picture has become normal, not only in relation to the number of cells, but even to the index of hemoglobin, and the patient who was low spirited, pale, emaciated and underweight when he started the treatment, has regained his normal condition, is feeling well and looking rosy when he has taken the necessary series of intramuscular injections of iron arsenate. This holds good in cases of obscure anemias, as well as in those cases which accompany or follow such diseases as tuberculosis, syphilis, malaria, etc., and in the disorders of metabolism in general.

DR. ALFRED STENGEL, Philadelphia: Hemolysis alone cannot be the basis for our judgment as to methods of treatment. Hemolysis is one factor in true pernicious anemia, and only one. There is the question of marrow activity after hemolysis has been reached, to a certain extent. Observations have been made pointing to specific infection of the bone marrow in some cases. These observations have not been published, but are under way at present. The question of syphilitic anemia, I think, is a proper one. I recall a case of syphilitic anemia of a grade which we see in the most severe pernicious anemia; this patient recovered quickly under antispecific treatment. There are also infectious cases with speedy recovery after removal of the infection.

There are conditions closely resembling pernicious anemia that get well with either Dr. Barker's treatment or Dr. Smithies' treatment; but I am unable to give any positive opinion as to what plan of treatment is going to be effective. I think we are getting nearer to proper treatment in removing subsidiary causes or in coaxing back the bone marrow into its previous activity.

DR. L. F. BARKER, Baltimore: Two points have come out in this discussion: first, the great difficulty in differential diagnosis in some of the cases, and second, the clear advantage in therapy of the removal of foci of infection, and in some instances, of transfusion. As to aversion to food, I believe that we can often do much by urging patients to take food in spite of absence of appetite. Dr. Christian has observed that transfusion increases appetite. In many cases it is necessary to tell a patient that his appetite is not a sufficient guide and that he should eat what the nurse brings him, despite anorexia. An abundant, mixed, roborant diet should be given; the patients should be encouraged to take it and to bear any slight discomfort that follows its ingestion. I agree that pancreatin and calcium carbonate in the amounts mentioned are somewhat unpalatable. We have given them on the theory that, in the absence of hydrochloric acid and of proper secretin-production, some aid to intestinal digestion might be beneficial. Many of us will overlook foci of infection even when we think our search has been thorough.

This brings me to the question of fever. I think it may be due sometimes to the anemia itself, but I think we should first assume that it is due to some focus of infection that we have not yet discovered and we should continue the search for an overlooked focus. If, in a severe anemia, a focus of infection be found, say in the teeth, one might be inclined to say "wait," but I think we should go ahead, give an anesthetic, even to a man with a hemoglobin of 30 per cent., and perform the operation to get rid of the focus of infection. I have done this in several instances with gratifying results. What has been said about transfusion has interested me very much, and I certainly think that patients that do not respond to other methods of treatment should be transfused. I do not want to be understood as being pessimistic about the outlook in even very severe cases, because we now feel that at least many of these anemic patients can be speedily returned to health and to work, and to the enjoyment of life.

Suckers.—We believe that the person who coined the statement, "A sucker is born every minute," sold patent medicines. Cumberland (Md.) *Health Bulletin.*

WOUND INFECTION AMONG LATHE WORKERS

AN INVESTIGATION INTO SOME OF THE FACTORS CAUSING WOUND INFECTION IN INDUSTRIAL SURGERY AND METHODS OF OBVIATING THEM *

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CLEVELAND

While serving in the emergency hospital of a large manufacturing plant last summer, I was impressed by the great number of infections and cases of furunculosis with which we had to deal. On some men a pinprick, if left unattended, developed into a severe lymphangitis; a slight scratch in twelve hours into a linear mass of pus; a slight abrasion into a suppurating ulcer, and a laceration into a mass of necrotic tissue and pus. There were dozens of cases of multiple furunculosis, some patients developing as many as fifty boils at once on their arms and legs and faces. It is probable that ours was not the only manufacturing plant troubled with experience of this sort, since out of the total amount paid for deaths by the Industrial Commission of Ohio last year, 22 per cent. was for those resulting from infections, and of the total amount paid for disabilities and loss of time, 10 per cent. was for the same cause.

In our plant there are employed about 2,000 men, representatives of many nations—Americans, Canadians, Irish, English, Scotch, Welsh, Swedes, Russians, Poles, Germans, Austrians, Lithuanians, Hungarians, Italians, Armenians, Slavs, Bulgarians, Serbians, etc. Their standards of living vary as much as their nationalities, some of them living in places as crowded, filthy and unkempt as are found in our city slums, others in clean, tidy cottages with little gardens. In age, they vary from 16 to 60. Their general health is good, seeming not to be affected in the least by personal filth or cleanliness. The tenure of employment is exceedingly variable, some men working only a few hours, while others have been with the company for twenty years. The majority of laborers, however, are transient.

Situated on a hill, the plant gets its electric power and water from Cleveland. The plant includes a carpenter shop, old machine shop, new machine shop, structural shop, forge shop, bond room, packing room, pumping station, power house, yard where the structural work is assembled, hospital and offices. Each department has its own toilet rooms, wash rooms and shower baths.

All these departments were represented by patients who came to the hospital. From fifty to sixty patients were seen daily, and of these from 8 to 10 per cent. had furunculosis, and about 5 per cent. had wound infections of various sorts (these percentages are mutually inclusive). It was soon noted, however, that these cases all came from the two machine shops. When this was investigated further, it was discovered that of all the 1,200 or more men in the machine shops, none had multiple furunculosis save those who worked on lathes, and furthermore that 90 per cent. of the infections occurred in men working on lathes. The new machine shop is given over to the manufacture of

* From the Laboratories of the Department of Hygiene and Bacteriology, Western Reserve University School of Medicine.

* Awarded $100 prize offered by the American Association of Industrial Physicians and Surgeons for the best paper on industrial medicine or surgery by any undergraduate medical student in America.

8-inch shells, and houses about 400 lathes. The old machine shop is given over to the manufacture of machinery of various kinds, and houses only about twenty or thirty lathes. The cases of infections and furunculosis in these two shops varied directly as the number of lathes in each. The men employed on the lathes were of all nationalities and ages, and of the same general health as the rest of the men.

The localization of all furunculosis and the fact that the great proportion of infections was among the lathe workers naturally made us suspect that some element of the lathe work was the causative factor. This was further emphasized by transferring some of the men. Several of those affected with furunculosis were transferred to different types of work in the same and in other departments. In a week the boils began to disappear, and before long the men were comparatively free from them. Likewise some men in other departments, free from furunculosis and infections, were shifted to lathe work. About 35 per cent. of these men developed furunculosis, and in nearly every case, slight wounds which ordinarily would have caused them very little trouble became exceedingly troublesome, requiring constant attention and care to prevent infection. This was considered sufficient proof that lathe work was causing the trouble. The next problem was to discover the troublesome factor.

There were two possibilities: oil and cutting mixture. The oil was suggested by some of the men, and not without reason. For it is a well known fact that employees in machine shops, factories, etc., in which the men come in contact with lubricating oils, which are used automatically again and again, are particularly liable to suffer from dermatitis and furunculosis, in the form of "oil pimples," on the parts of the body which are constantly in contact with the oil. Elsewhere in the shop, however, there were men working in oil who had oil pimples, but whose furunculosis was not nearly so severe, and who were not nearly so susceptible to wound infection as the lathe men.

Cutting mixture is a compound of animal fats, petroleum oils and, as a rule, acids, used to facilitate the action of the cutting tool of the lathe on the object in the lathe. As the work revolves in the lathe, the cutting mixture runs in a steady stream on it at the point of application of the cutting tool. It then runs down over the work and the lathe into drains beneath. These drains empty into a central reservoir, from which the mixture is pumped up into tanks near the roof. With the aid of gravity, the mixture flows from these tanks through the system of pipes to the lathes. Thus the mixture is used over and over until it becomes so dirty as almost to clog the pipes. This, at least, was the condition before our investigation. The men are accustomed to spit into the mixture in the drains beneath their machines, throw their tobacco into it, and otherwise contaminate it. As they work, they are constantly in contact with both the oil and the cutting mixture, with which their clothes are often saturated. Thus it seemed that either might be a fruitful source of infection.

Having determined the possible causative factors, we set about the investigation of each of them. Stained cover-glass preparations, made from the oil and the cutting mixture, showed the presence of cocci and bacilli—very few in the oil and very many in the cutting mixture. Then cultures from each were made on glycerin agar and blood serum, and incubated in an electric incubator at 37.5 C. (99.5 F.). No growth whatever was obtained in the cultures made from the oil, as the tubes were absolutely clean. On the other hand, the cultures made from the cutting mixture were covered with a cream-colored growth in about twelve hours, the glycerin agar having more growth than the blood serum. Smears made from these cultures showed an enormous number of staphylococci, some large diplococci, a few short chains of streptococci, and several strains of bacilli. This was repeated a number of times, and the same results were obtained each time. Plates made from these specimens contained a number of putrefactive colonies, mostly aerobic spore-bearers, and a large number of colonies of *Staphylococcus aureus*. Cultures made from the furuncles and the infected wounds showed the same kind of growth, and the smears showed the same kinds of organisms.

We next tried the effects of inoculation. A series of guinea-pigs was inoculated with suspensions of organisms from cultures made from furuncles and infected wounds, and a second series was inoculated with suspensions from cultures made from the cutting mixture. Three modes of inoculation were tried, namely, scarification, subcutaneous injection and intraperitoneal injection. Other pigs had similar inoculations of distilled water and some had none. These served as controls. The results are shown in the accompanying table.

Ten days later, when the pigs were all apparently normal again, I repeated the experiment, changing the pigs around, and I obtained practically the same results. After another intermission of ten days, I repeated the experiment again, and got practically the same results, though the reactions were less pronounced. Guinea-pigs were rather an unfortunate choice for these inoculations, for I discovered later that they are somewhat immune to staphylococcus infections, and staphylococci made up the greater majority of the suspensions. Considering this immunity, I feel that, since all of the inoculated pigs reacted, the virulence of the organisms was, perhaps, above the average.

These results demonstrated rather conclusively that the cutting mixture was the cause of many of our infections, and also that any harm done by the oil was probably not due to its bacterial content. There was still a possibility, however, that the oil was causing the furunculosis. But "oil pimples," though numerous, do not develop into the large boils, and even carbuncles, with which so many of our patients were affected. The oil might have a local effect, causing irritation and an inflammation which, instead of leading to an effusion of liquid, leads to an emigration of leukocytes, thus producing pustulation, a type of dermatitis venenata. Some drugs possess a specific chemotactic power on leukocytes and thus lead to a septic pus formation. Their injection (hypodermic or into serous cavities) leads to the collection of pus even when asepsis is perfect. Turpentine, croton oil, petroleum, mercury, silver nitrate, digitoxin, cadaverin and a few others are the principal examples. All boils and pimples investigated, however, contained staphylococci. It may be that the constant irritant action of the oil on the skin, following the hairs down into the hair follicles, and setting up an irritation there, caused localized points of lessened resistance which readily succumbed to the attacks of any staphylococci which might later gain access to them. It is not likely that the oil itself is so strongly irritant as to cause furunculosis unaided.

We must consider, then, as causative factors, both oil and cutting mixture, but especially the latter, since our investigations seem to place the greater blame on it.

On inquiry at the Department of Bacteriology of the Public Health Division of Cleveland, I found that specimens had been submitted for analysis from various plants having apparently the same difficulties we were having. Plates made from certain specimens of wash water and lard oil were found to contain a number of putrefactive colonies, mostly of the *Bacillus subtilis* type, together with a few molds. No pyogenic organisms were found. A specimen of alkali water was found to contain 210 colonies per gram, mostly of the *B. subtilis* type, but no pyogenic organisms. A specimen of oil before use contained several putrefactive colonies, but no pyogenic organisms. A specimen of oil after use contained numerous putrefactive colonies and a number of colonies of *Staphylococcus aureus*.

It will be noted that the last of these specimens presented the same bacteriologic findings as did our own

PROPHYLAXIS

We next faced the problem of prevention, the prophylaxis. In regard to the oil, about all we were able to do was to try to find men who were more or less immune to its irritant action. There seemed to be no way of counteracting the irritant action without injuring the properties of the oil. With the cutting mixture, however, it was an entirely different problem. This contained living organisms, the main cause of our trouble. The problem, then, was to find some cheap and effective means of killing the organisms without injuring the properties of the mixture. The possibilities were (1) sterilization by heat and (2) disinfection by chemicals.

Sterilization by heat can be carried out in a variety of ways. Probably the most effective method is by circulating steam through coils of pipe placed in the reservoirs and tanks containing the mixture. In this way the temperature attained by the mixture in the tanks is sufficient to kill the organisms present. A disadvantage of this method, however, is that as soon as

EFFECTS OF INOCULATIONS

Method	Time After Inoculation				
	24 Hours	36 Hours	48 Hours	72 Hours	120 Hours
Control pigs	Lively as ever	Well	Well	Well	Well
Cutting mixture: Scarified pig	Lively, but seropurulent material along excoriations	More pronounced	Healing	Healing	Healed
Subcutaneous	Decidedly less lively.	Lay inert in corner of cage, under straw; roused with difficulty	Sick, almost comatose	Recovering	Almost well (well in 8 days)
Intraperitoneal	Decidedly less lively..	Inert in corner of cage; under straw; roused with difficulty	Almost comatose	Slightly better	Recovering (well in 7 days)
Wounds and furunculosis: Scarified	Very lively, but pus under scabs on excoriations	About same	Healing	Healed	Healed
Subcutaneous	Somewhat less lively..	Very quiet; not easily roused	Inert in corner of cage under straw; roused with difficulty	Slightly better; more easily roused	Much better; practically well
Intraperitoneal	Much less lively	Almost comatose	Slight movement; roused with difficulty	Better	Better (well in 6 days)

cutting mixture. Our oil also showed the same morphologic forms, but the organisms in it did not grow, and so probably were dead.

The portals of entry by which the germs might gain access to the system were many—cuts, abrasions, puncture wounds. Small particles of flying steel from lathes cause innumerable small puncture wounds, each of them sufficiently large to form a portal of entry. We passed the electric magnet over many arms apparently free from steel, and the magnet came away covered with fine steel "hairs" and splinters pulled out of the arms, leaving almost microscopic puncture wounds. We made cultures from the arms of these men, and in less than ten hours the cultures were covered with bacterial growth. Cultures from the arms of twenty-five college students were made in the same way. The majority showed some slight bacterial growth, but nothing approaching that obtained from the arms of these working men. It could not be otherwise, for the arms of the latter were constantly wet with oil and cutting mixture.

the mixture leaves the pipe it is so distributed that it at once becomes recontaminated, and therefore reaches the workmen in almost as dangerous a condition as before treatment.

The other method, that of disinfection by chemicals, obviates this disadvantage, since the bactericide is constantly present and renders harmless any organism that might come in contact with it. The selection of the proper germicide for disinfection is really a problem for the makers of the mixture, and as soon as we made them acquainted with the facts, they were glad to cooperate with us and to do all in their power to render the mixture sterile. It may be well, however, to mention some of the difficulties in making a compound of this sort germ-proof. In the first place, it is impossible to use any inorganic or metallic germicide or disinfectant such as mercuric chlorid, copper sulphate, silver nitrate or ferrous sulphate, because of the action of the chemical on the metals with which it would have to come into contact. Oxidizing and reducing agents, hydrogen peroxid, potassium permanganate, sulphur

dioxid, ozone, iodin, bromin, chlorin, etc., are ineffective because of their instability and the presence of organic matter in the cutting mixture. Likewise, disinfectants of the fatty series, such as chloroform, iodoform and alcohol are too unstable and also too costly. Some of them would also interfere with the action of the compound. As alkaloids are unsuitable, the only group left is the coal tar series, including phenols and cresols. This group is the least objectionable.

But many members of the coal tar series are also useless for our purpose, for the nature and quantity of the associated material is of great importance and must be taken into account.

Cutting mixture is a more or less oily solution containing considerable organic matter, especially after passing through the pipe and drainage system several times. Phenol (carbolic acid) acts antiseptically scarcely at all when in oily solutions—a fact due to their great solvent power for phenol, and to their ability to prevent its transfer to the bacterial protoplasms. Likewise in the presence of much organic matter, phenol, to be effective, must be used in concentration of about 5 per cent., which is too high a percentage to be desirable from its toxic standpoint. From the standpoint of effectiveness, the degree of dilution of the antiseptic is also important. A 5 per cent. solution of phenol is much more effective than either a 2 per cent. or a 25 per cent. solution. On the other hand, a solution must be strong enough in any given case to be effective. The various antiseptics vary greatly in their effective strength. The element of cost also enters here.

The toxic and corrosive action of the agent and the ease with which it is absorbed are of importance in deciding its practical usefulness. Some men are susceptible to the odor of coal tar antiseptics such as phenol and cresol, and cannot work with solutions of which these are a part. This is one of the difficulties we encountered. Then, too, the cost of the disinfectant is an important factor, especially in these modern days when manufacturers watch closely every element entering into the cost of production, in order to cut down to the smallest margin the producing cost of the manufactured article.

We have shown that the coal tar disinfectants are practically the only ones available for our purpose. Of these the cresols are of the most importance. They form the major part of crude phenol, and contain the methyl group. This group diminishes its toxicity and increases its antiseptic power. The cresols are about three times as powerful as phenol in disinfecting value. A strength of from 1 to 1.5 per cent. is effective, and is only about one fourth as toxic as phenol. Their cost is also much less than that of phenol. The one disadvantage of cresols is their very slight solubility in water. This insolubility can be readily overcome, however by emulsifying agents. A cresol, then, would seem to be the most practical disinfecting agent for our purposes.

Two methods of sterilization, then, are available: by heat and by chemical disinfection. Both have been tried and found more or less effective. A large foundry about a mile from the plant of which I have been speaking had the same trouble. Here the heat method was used and it was found that the infections and furunculosis were considerably reduced, though not entirely stopped. The chemical method was tried in our plant. Phenol was found to have the disadvantages enumerated in the foregoing. It kept organisms from growing in the mixture only about one and a half days. Next a mixture of phenol and wood alcohol was added to the cutting mixture sufficient in amount to make a 5 per cent. solution when diluted with water. This was found more efficient than phenol alone. Solutions and preparations of cresol were then tried, and it was found that a smaller percentage kept the solution free from living organisms for a much longer time than did phenol, namely, for six days. Another dose had to be added then or else new cutting mixture had to be used to keep the mixture sterile, partly because additions to the number of bacteria in the mixture were constantly being made. This served to reduce markedly the infections and furunculosis, but some of the men could not work with it because of susceptibility to the odor. This is a small matter, however, which may be readily overcome.

It is quite likely that further modifications may be made which will reduce the number of cases still more. For the past three months, the cases of infection have been less than 0.5 per cent., and no complaints are heard from the men regarding either oil or cutting mixture. Whenever it seems probable that living pyogenic organisms are present in the oil, a germicide also might be added to it. We did not try a combination of heat and disinfection, for there was no steam in the shops, all the power being electric. But when steam is available, I believe that a combination of both methods would prove effective, and would greatly reduce the cases of furunculosis and infections, with which the emergency hospitals of many of our large manufacturing plants have to deal. In places where the men are sufficiently intelligent, a program of education in sanitation should be instituted so that the oil and cutting mixture would not readily become contaminated.

SUMMARY AND CONCLUSIONS

1. In a large manufacturing plant the vast majority of cases of wound infections and furunculosis were found to be localized among lathe workers in the machine shops.

2. The peculiar features of lathe work are the use of cutting mixture and oil, and the manner in which these circulate and are used repeatedly, thus making them extremely liable to contamination. This contamination rendered them open to suspicion as factors in the causation of the wound infection and furunculosis.

3. These suspicions were borne out by bacteriologic investigation and animal inoculation, which showed the causative factor to be pyogenic organisms which were present in vast numbers in the cutting mixture and less numerous in the oil. Marked results were obtained.

4. Abundant portals of entry for these organisms were found on the arms of workingmen in innumerable small cuts and punctures made by flying chips of steel from the lathes.

5. The methods of prophylaxis possible are: (*a*) by heat; (*b*) by chemical disinfection, and (*c*) by a combination of the two. Various chemical disinfectants were tried, and the cresol group was found to be the most effective and the least expensive.

6. By use of chemical disinfection (cresols), wound infections have been reduced from 5 per cent. to less than 0.5 per cent. in the plant under consideration, and furunculosis has almost disappeared.

1356 East One Hundred and Twenty-Fifth Street.

THE FRACTIONAL TEST MEAL

A STUDY OF 377 FRACTIONAL TEST MEALS, OF WHICH 139 ARE IN PROVED PATHOLOGIC CONDITIONS

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During the past two years there have been 377 fractional test meals given in the Medical Clinic of Wesley Memorial Hospital, under the supervision of Dr. Charles A. Elliott. Thirty of these test meals, as previously reported,[1] were tried on normal individuals, nurses and medical students, eighty-nine on patients in whom the diagnosis has been proved either at operation or at necropsy, forty-five on patients in whom the diagnosis was clinically certain but not proved, and 213 on patients in whom the diagnosis was not absolutely certain and could not be proved.

The present report deals with a total of 139 cases, in sixty-five of which the diagnosis was proved at necropsy or operation and in seventy-four of which there could be no doubt as to the actual condition present. These cases are divided into six groups: (1) diseases of the gallbladder, thirty-eight cases; (2) gastric ulcer, ten cases; (3) duodenal ulcer, twenty-six cases; (4) gastric carcinoma, eight cases; (5) pernicious anemia, eleven cases; (6) miscellaneous, forty-six cases.

The technic uniformly followed was that previously reported (Talbot) from this clinic. In those unusual cases in which the patient found it difficult to swallow the tube, a specially constructed bucket and a tube fitted with a wire obturator, as devised by Dr. Allen B. Kanavel,[2] were employed.

Special attention was given to the emptying time, first of food and then of secretion, for the two periods do not always coincide. The emptying time was considered of special importance and was well demonstrated by means of the fractional test meal.

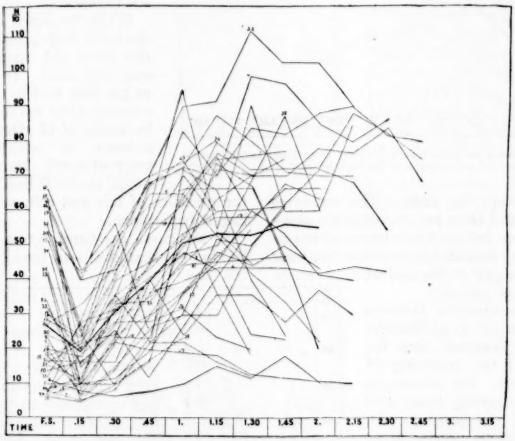

Chart 1.—The total acid curves in thirty-eight gallbladder cases (with operation in thirty-four). Note the low acidity of the fasting content (*F. S.*), the prompt response, the fairly constant time of maximum acidity, and the early emptying time at or near the high point. The gastric cycle is incomplete. In this and the following charts the heavy line represents the mean acid curve and terminates at the mean emptying time.

DISEASES OF THE GALLBLADDER

This group consists of thirty-eight cases. In thirty-four, the diagnosis was proved at operation, and in four, the diagnosis was conclusive.

Fasting Content.—The amount of gastric content obtained from the fasting stomach varied from 2 to 255 c.c. The latter amount is exceptional, as in only two other cases did the amount exceed 60 c.c. The average was 27 c.c., exclusive of the one exceptional case. Free acid was absent in nineteen cases, below 20 in nine, between 20 and 40 in seven, over 40 in four, with a maximum of 54, the average being 14. The total amount of acid ranged from a minimum of 6 to a maximum of 66, with an average of 29. The highest reading for total acid, in cases in which free acid was absent, was 22. Lactic acid was uniformly absent in twenty-six cases. Gastric mucus was present in excessive amounts in seventeen cases. A benzidin test for blood was positive in three out of thirty-five cases. The microscopic findings were not interesting except in one case in which many pus cells were found in the fasting stomach content. The stomach content for this case gave a positive Gmelin test, and the case proved to be one of cholecystitis, with distention of the gallbladder.

Fractional Meal.—In the acid curve, the beginning of response to the test meal varied in onset from a few minutes to forty-five. In eleven cases it occurred less than fifteen minutes after the test meal, in nineteen cases, between fifteen and thirty minutes after the test meal, and in five it was delayed beyond the thirty minute period. In four cases there was no response. The response, whether prompt or delayed in onset, was gradual in development. The maximum amount of free acid varied from 0 to 80, with an average of 41. For the total amount of acid, the maximum varied from 14, in a case without free acid, to 112, with an average of 60. In point of time, the amount of free acid was highest at from thirty minutes to three hours, averaging one hour and twenty-eight minutes. The high point of total acidity occurred at from thirty minutes to two and one-half hours after the test meal, averaging one hour and twenty-two minutes. For both free and total acid content, the time of the high point was constant, regardless of the promptness of response. This point is illustrated in the accompanying tabulation.

CONSTANCY OF HIGH POINT OF ACIDITY

Cases	Response	Average free HCl	Average total HCl
11	0 to 15 minutes	1 hr. 35 min.	1 hr. 24 min.
19	15 to 30 minutes	1 hr. 40 min.	1 hr. 35 min.
5	30 minutes +	1 hr. 42 min.	1 hr. 36 min.

The type of response is fairly constant in most gallbladder cases. The acid values rise to the high point, at which the stomach empties, the gastric cycle not being completed in twenty-seven of thirty cases. Bile was present in four cases occurring after fairly high

1. Talbot, E. S.: The Examination of Normal Gastric Secretion by the Fractional Method, THE JOURNAL A. M. A., June 10, 1916, p. 1849.
2. Kanavel, A. B.: Surg., Gynec. and Obst., October, 1916, p. 483.

acid values were reached. It was accompanied by a decided drop in acidity.

Pain occurred during the test meal in only one case, was moderate in degree, independent of acid readings,

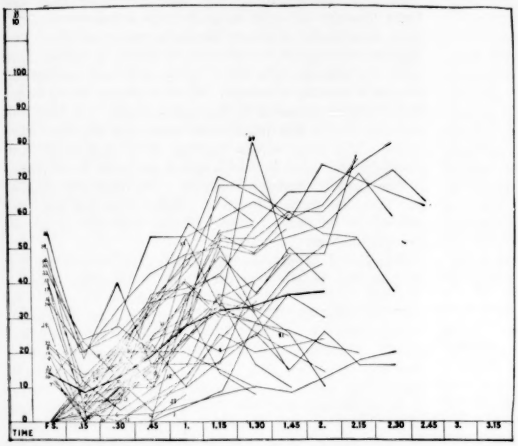

Chart 2.—The free acid curves in thirty-four gallbladder cases (four anacid curves not shown). Note the tendency to empty early at the high point.

and relieved at the emptying time. The emptying time in the majority, that is to say, twenty-two cases, was between one and one-half and two hours after eating. Only twelve cases continued beyond the two-hour period, and all were empty at the end of two hours and forty-five minutes.

Summary.—The characteristic features of the fractional test meal in gallbladder cases are: (1) fairly constant time for maximum acidity; (2) the emptying of the stomach at or near the maximum acidity; (3) early emptying time, and (4) incompleteness of the gastric cycle, interrupted by the emptying process at or near the maximum acidity.

DUODENAL ULCER

In this group, consisting of twenty-six cases, there are fifteen confirmed by operation and eleven in which the clinical diagnosis was certain.

Fasting Content.—From the fasting stomach the amount obtained varied from 5 to 175 c.c., with an average of 50. Eleven cases had less than 30 and eighteen less than 50 c.c., while eight had over 50 and only one over 100 c.c. The free acid value ranged from 0 to 80, with an average of 26. The total acidity varied from 6 to 100, with an average of 43. Five showed a total acidity above 80. Lactic acid was absent in all. Gastric mucus was excessive in seven. Microscopically, food remnants were found in only one, in which the fasting content was 131 c.c., free acidity 70 and total acidity 86. In one, red blood cells were observed with many puss cells, motile bacilli and *Trichomonas intestinalis.*

Fractional Meal.—There was no case of anacidity in this group. In nearly all cases with high acid fasting content, there was a sharp drop in the curve after the test meal was taken. The response to the food stimulus began in seven cases before the fifteen minute period, in eighteen cases before the thirty minute period, and in only one case later than thirty minutes. The response was gradual in development in twenty cases and abrupt in six cases, three of which showed a high acidity in the fasting content. The maximum acidity was reached in from forty-five minutes to three hours after the test meal, with an average time of one hour and thirty-six minutes. Acid values ranged from 24 to 110, averaging 66. The high points of total acidity were 44 to 124, with an average of 85, occurring in from one to three hours after the test meal, the average period being one hour and thirty-six minutes.

While the acme of the curve showed a distinctly high point in nearly all the cases, this level was sustained as a plateau in only five cases. In one there was a drop in the free acid to 0, one hour and fifteen minutes after eating. This was followed by a rise to 42 after two hours and thirty minutes, at which time the stomach emptied itself. In another there were two drops to the 0 line, each accompanied by the presence of bile and followed by a rise, giving the line a triple apex.

In six cases the Gmelin test for bile was positive. Its first appearance was usually accompanied by an abrupt fall in acidity. In one case it was a terminal finding. In three cases it was detected at one point during the test but disappeared, followed by a distinct rise in acidity.

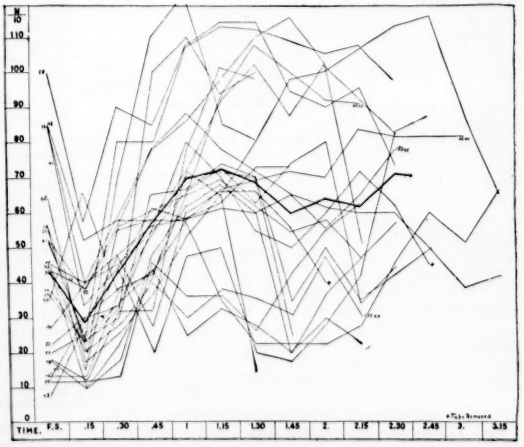

Chart 3.—The total acid curves in twenty-six duodenal ulcer cases (with operation in fifteen). Note the extremes of acidity of fasting content, the prompt secretory response to food stimulus, the high acidity, and the delayed emptying time.

In one case, bile was constantly found from the end of the thirty minute period to the time of emptying, two and one-half hours after eating. In another case, it appeared at the end of one hour after eating, and

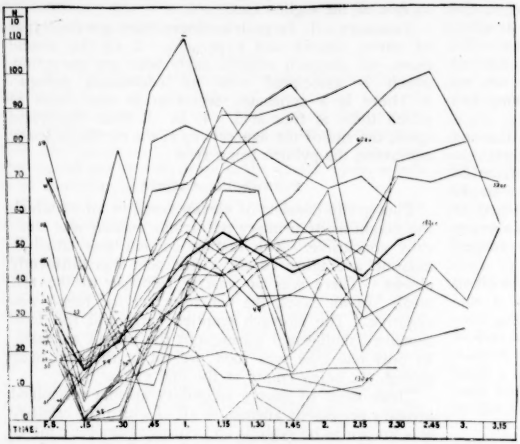

Chart 4.—The free acid curves in twenty-six duodenal ulcer cases (with operation in fifteen). Note the prompt secretory response, the high free acidity, and the delayed emptying time. There are no anacid cases in this group.

was constantly present until the stomach emptied at the end of two and one-half hours.

In one case, the benzidin test for blood was positive at the apex of the curve. Its appearance was followed by an abrupt fall in the acidity. In this case a chronic ulcer surrounded by many adhesions was found just outside the pylorus.

In eight cases, complaint was made of pain, which, in six of these cases, was described as burning in character and occurred at or just preceding the high acid point, which varied from 54 to 110 free acid. Pain continued until the acidity again fell to a figure corresponding to that at onset. In two cases, the pain was colicky or peristaltic in type, of short duration and with a lower acidity, that is to say, with a free acid content of from 20 to 34.

In this group the type of curve varies greatly, especially in the latter phase, which is most affected by disturbed motility and emptying power. Eighteen cases revealed a normal diverging rise in free and total acid curves, an acute or sustained apex, and a converging decline in acid values throughout the period extending to the emptying time or the discontinuance of the test. In seven cases the decline was abrupt, while in the others it was gradual, varying in length of time, and in some remittent. In six cases the acid values were so sustained and the emptying time so delayed, if, indeed, it came at all, that, in view of the high acid finding in the fasting content, one was justified in classing them as cases of continued secretion. In six cases there was no declining phase, in four cases the stomach emptied at a delayed high point, and in two, a large amount of the content was aspirated at a much delayed point when the test was discontinued.

The emptying time varied from one and three-fourths to three and one-half hours. Food particles disappeared from fifteen minutes to two hours and thirty minutes before the emptying time.

Summary.—The characteristics of this group are: (1) lack of anacid cases; (2) larger amount of fasting content; (3) high acidity, the highest values being found in this group; (4) delayed emptying time, with continued secretion in six cases, and (5) frequency of pain, which occurred in eight out of twenty-six cases.

GASTRIC ULCER

This group consists of ten cases, eight proved by operation and two in which the clinical diagnosis was certain.

Fasting Content.—The amount varied from 10 to 200 c.c., with an average of 65. The amount of free acid ranged from 0 in two cases to 84. In five cases it was more than 50, the average being 35. The total amount of acid ranged from 6 to 97, in five being more than 50, and the average being 51.

The contents were colorless with one exception, which was green and which gave a positive bile test with an excess of mucus and no blood, the ulcer being at the lesser curvature. Mucus was excessive in two cases. Blood was found in none, and bile was present in two.

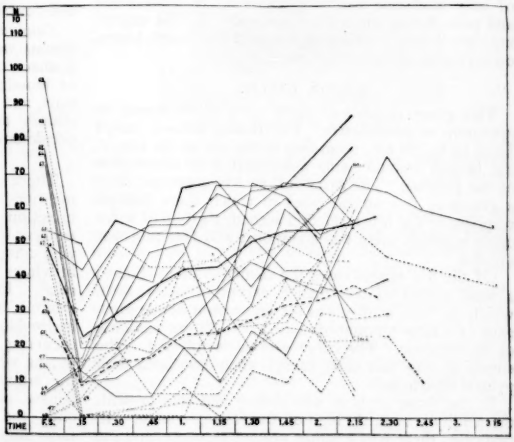

Chart 5.—The fractional test meal curves in ten gastric ulcer cases (with operation in eight). Total acid is indicated by the continuous lines, free acid by the interrupted lines. Note the high acid values of the fasting stomach content as compared with that obtained in the curve, the delayed and weak secretory response, the moderate height of curves, and the fairly uniform emptying time (seven cases at two and one-fourth hours).

Fractional Meal.—Of four cases which revealed high acid findings in the fasting content, the test meal was followed by an abrupt fall in the free acidity to 0 in three, and from 84 to 22 in the fourth. In two other cases the fall was gradual and less in degree. In two cases showing anacid fasting contents, the response was prompt in onset and gradual in development. In two cases the response began between the fifteen and thirty minute periods, in one it was delayed until the end of one hour, and in one there was no perceptible response until the end of one hour and fifteen minutes.

The maximum free acidity was reached at the end of a period varying from one and three-fourths to two and one-half hours, with values varying from 28 to 70, the average time being two hours with 49 acidity. The total acid high point was reached at from one and one-half to three hours, with an average of two and one-fourth hours. The acidity ranged from 40 to 88, the average being 65.

Bile was present in three cases. In one case with an ulcer at the lesser curvature with adhesions, it was present throughout the test, including the fasting content. In another case, bile was present at the end of fifteen minutes after an abrupt drop in acidity from a high fasting point of 62 free and 74 total. In a third case, it was present at the end of the one and one-fourth hour period, accompanied by a prompt fall in acidity.

Blood was demonstrated in only two cases. The pain, which was described as burning, was present in only one case, which showed the moderate acidity of 54 free and 64 total.

Summary.—The characteristic features of the fractional test meal in gastric ulcer are: 1. The amount of the fasting content is comparatively large. 2. The response is weakened and delayed. 3. A high point of only moderate acidity is attained. 4. Free blood and pain during the test are unusual. 5. The emptying time is fairly uniform at two and one-fourth hours, occurring in seven of ten cases.

GASTRIC CANCER

This group consists of eight cases all confirmed by operation or postmortem. The fasting content varied from 10 to 238 c.c., according to the site of the tumor, the largest amount being associated with obstruction at the pylorus. The cases fall into two groups, first, a group of five anacid cases in which there was no response to the test meal, and second, a group of three cases in which there was a response and free acid was present.

Of the five anacid cases the fasting content showed a total acidity of less than 8 except in one case in which the total acidity was 60, on account of the presence of a large amount of lactic acid. There was little or no response. The curve was uniformly flat. The emptying time was early except when associated with pyloric obstruction.

In the three cases in which free acid was present, the acidity was fairly high on the fasting content. In two cases there was a rather prompt response, and the free acid values were fairly high in all. In one case, the high point was reached in thirty minutes, and in the others, at the end of two hours. In one case there was a continued secretion. In all three cases, with free acid present, the pylorus was not involved, the tumors being prepyloric, on the lesser curvature, and cardiac, respectively.

The free acidity reached 40, 56 and 74, respectively, the total acid and free acid curves being parallel to each other.

The emptying time was two hours or less in five cases and much delayed in three. Blood was present in five of the eight cases.

Summary.—1. In gastric cancer there are two types of curve, anacid and hyperacid. 2. In the anacid cases, the stomach empties early with one exception, which is associated with an edematous pylorus. 3. There is a continued secretion in two cases in which there is free acid. 4. In all three hyperacid cases, the site of the cancer was at the cardia or lesser curvature, the pylorus being free.

PERNICIOUS ANEMIA

This group consists of eleven cases, in all of which the diagnosis of primary pernicious anemia was clinically conclusive. The fasting content was small in amount, averaging 14 c.c. Free acid was uniformly absent. There was no gastric response to the test meal. In all cases, the benzidin test for blood was negative. The stomach emptied early and the food remained undigested throughout the test in all cases. In only one case was food present at the two hour period, six being empty at the end of one hour.

Three cases of severe secondary anemia resembled primary pernicious anemia, in all of which the etiology was known to be syphilis and chronic hemolytic infection. In two of these cases, the results of the fractional test meal differed markedly from those obtained in the cases of true pernicious anemia, in that the response to the test meal was marked, though somewhat delayed. In other words, free acid values of 35, 40 and 65, respectively, were obtained. In all cases, the response began thirty minutes after the test meal, and the high point was reached at the end of one and one-fourth hours.

Summary.—In pernicious anemia the following conditions were observed: (1) a small amount of fasting stomach content; (2) complete anacidity; (3) absence of blood; (4) unchanged food; (5) early emptying time, and (6) the presence of free acid in severe secondary anemias of known etiology simulating true pernicious anemia.

INFECTIONS

There is a small group of anacid cases of which mention should be made. These embrace chronic infections, such as arthritis, myositis, neuritis, chronic endocarditis, acne and boils. They occurred in patients who complained of no gastro-intestinal symptoms and in whom no acid was found during the fractional test meal. In a case of acne, the eruption apparently cleared up after the systematic administration of hydrochloric acid. Of two patients with hyperacidity occurring in duodenal ulcer, and given ulcer treatment during which the acid was continuously neutralized by the administration of large doses of sodium bicarbonate and magnesium oxid, one developed appendicitis, and the other, multiple acute arthritis. These facts suggest the protective nature of the hydrochloric acid in preventing infective agents from gaining access to the gastro-intestinal tract, or possibly to the general circulation, and would seem to warrant the making of a fractional test in all cases of chronic focal infections of unknown etiology. They also suggest the possible danger of general infection in neutralizing the acid in hyperacid cases.

Two important features of this group of anacid cases are the frequency of gastric anacidity in cases of chronic colitis without gastric complaint, and the value of hydrochloric acid therapy in pernicious anemia. The latter feature, which has been frequently observed in this clinic, also suggests the importance of the defensive rôle of hydrochloric acid as an antiseptic agent in the gastric secretion.

CONCLUSIONS

1. The fractional test meal satisfies the clinician as to the amount and character of the fasting stomach content, the gastric response, the acidity, the amount and character of secretion, the degree of gastric digestion, the presence of blood, the amount of bile, and the pain at any specific point in the gastric cycle, which is of considerable diagnostic value.

2. Certain fairly constant characteristics of the curve are noted in various diseases. In gallbladder disease the secretory response is prompt with high acidity, and the emptying time occurs at or near the high point. In duodenal ulcer there is a prompt gastric response, high acidity and delayed emptying time. In gastric ulcer, not affecting the pylorus, there is a weak and delayed response, moderate acidity and early emptying time. Gastric carcinoma presents two types of curve, the first showing the presence of acid and a delayed emptying time, and the second showing the absence of acid and an early emptying time. Pernicious anemia shows an anacid curve and an early emptying time, while severe secondary anemia shows a definite secretory response and a delayed emptying time. Chronic focal infections may show anacid curves suggesting the gastro-intestinal tract as a possible atrium of infection.

30 North Michigan Avenue.

PROLAPSE OF THE FEMALE URETHRA *

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While a slight amount of eversion of the female urethra is not uncommon, a pronounced bulging or prolapse of the mucous and submucous tissues is fortunately rare. The condition is found with greatest frequency in children, namely, in 60 per cent. of reported cases, while in patients aged from 15 to 40, only 12 per cent. are noted. Again, the percentage rises to 28 per cent. in women affected who are over 40 years of age. The youngest patient mentioned was an infant 5 days old, and the oldest was a woman of 92 years. Debilitated children and old people are those most often affected.

Portions of the mucous membrane removed have been carefully studied by various observers, and in some instances the tissues were found normal, while other specimens examined showed evidences of vascular and inflammatory changes. A number of investigators reported angiomatous nodules with vascular and connective tissue changes. The epithelium had disappeared from some of the projecting angiomatous nodules, which may account for the bleeding which so frequently accompanies this condition. Fibromyomatous changes have also been found with hypertrophied submucous glands.

While these pathologic conditions are of interest, they represent end-results, as they were made from tissues removed when the prolapse was complete, and throw no light on the etiology. The condition of the mucous and submucous structures in the early stages of the prolapse, we have no way of determining.

The large number and variety of theories as to the etiology of prolapse of the urethra is ample evidence that the cause is not definitely known. Among the predisposing causes that have been mentioned are: cough, constipation, straining at stool, trauma, cystitis, vesical tenesmus, stone in the bladder, parturition, angioma and general debility.

Dr. Thomas Addis Emmet, that master of plastic surgery, who gave careful thought to this condition, believed that during parturition, the head of the child pressed forward the loose tissues about the neck of the bladder, and also lacerated the periurethral structures, so that prolapse of the urethra followed. This theory is untenable, as we know that the majority of

Fig. 1.—Prolapse of the urethra.

cases occur in children, and many cases are reported as having occurred in women who have never borne children.

I believe that the cause is neuromuscular; that the nervous mechanism that controls the detrusor urinae muscle loses its normal balance and exerts too great a force on the normally loosely attached mucous membrane of the urethra, producing extrusion of this membrane; consequently the constrictor muscle of the urethra becomes partially paralyzed and cannot regain its tone, until the membrane is replaced and held there by the shortening of the sphincter muscles, or by the employment of some other operative procedure.

The symptoms found vary with each case. There may be no discomfort experienced by the patient, and attention is called to the condition solely by the presence of a slight, bloody discharge. Other patients complain of sudden, severe and continuous pain, with vesical tenesmus and frequent micturition. A protrusion can be seen and felt at the site of the meatus urinarius. Ulceration and even gangrene with sloughing of the protruding membrane has occurred.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Treatment by applications of astringents, tincture of iodin and caustics has effected cures in comparatively few instances. Local applications have also been used to allay inflammation. However, some form of operative interference is usually found necessary.

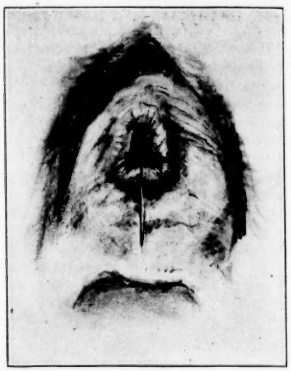

Fig. 2.—Incision through the mucous membrane and muscle.

Several methods of operative procedure have been employed with varying success.

Dr. Emmet, as early as 1879, devised what he termed the button-hole method of operating, which proved effectual in curing a number of cases. He illustrated the operation by drawing a small part of a handkerchief through a button-hole in a coat. He placed a sound in the urethra, and then made an incision in the anterior wall of the vagina, over the midportion of the urethra, down to the redundant mucosa. This he withdrew through the opening made

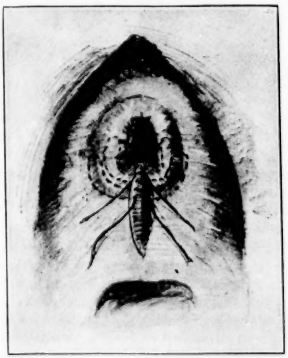

Fig. 3.—Buried sutures in circular muscle.

and held the membrane in the wound with sutures. He then removed the excess of mucous membrane, tied the sutures and closed the wound made in the vagina.

The protruding mass of mucous membrane has been transfixed by two ligatures which were tied on either side and the tissues distal to the ligatures were then removed. I mention this procedure only to condemn it.

Also the cautery has been used, as in prolapse of the rectum; but has been followed in some instances by a cicatrix, which contracted and narrowed the meatus until it was possible to pass only a small sized probe and which necessitated subsequent operative measures.

The method most frequently employed has been to excise the projecting membrane with a knife or scissors, and to suture the urethra to the edges of the adjacent mucous membrane.

Profuse hemorrhage has resulted in some instances, and recurrences following this method have been frequent.

REPORT OF CASE

L. H. C., a woman, aged 53, single, on whom I had operated in January, 1911, for uterine fibroids, by an abdominal hysterectomy, consulted me, Feb. 1, 1917. She had been perfectly well until one week previously, when she experienced a frequent desire to pass urine. She also remarked

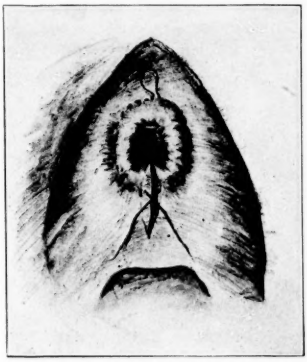

Fig. 4.—Purse-string buried suture.

a slight amount of bloody discharge from the vagina, and during the last few days had felt a projection presenting at the vulvar orifice.

Inspection revealed a mass about the size of a ripe olive and of a mahogany color. It was sensitive to the touch and nearly filled the small vaginal outlet. I thought it might possibly be a fibroid, with a long pedicle, which was presenting at the vulva.

Feb. 2, 1917, under ether anesthesia an attempt was made to catheterize the patient, but the opening into the urethra could not be seen. The upper part of the mass reached to within a short distance of the clitoris. The index finger was passed below the mass into the vagina, and a normal cervix was found. When the mass was raised, an opening was found on its under surface, through which a glass catheter was passed into the bladder and urine obtained. We now realized that we had to deal with a prolapsed urethra; but the best method of procedure was not so clear.

About three weeks previously, I had operated with success on a woman who had been married eight months, and who had suffered from incontinence of urine during the last five months.

Examination revealed an absence of vagina, a rudimentary uterus, and a dilated urethra, due to attempts at coitus. The operation I had found effective in this

case I thought might prove of value in the case of the prolapse of the urethra.

Accordingly I was able to replace by digital manipulation the swollen and prolapsed mucous membrane of the urethra, which formed the tumor. The urethra was found so dilated

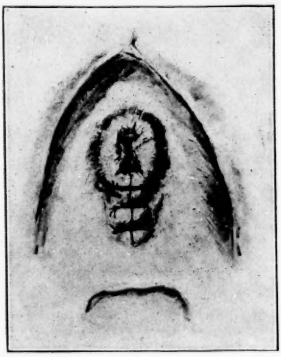

Fig. 5.—Interrupted sutures in mucous membrane.

that I passed my finger into the bladder and could determine that there was no calculus present.

A vertical incision was made in the lower part of the urethral meatus, through the mucous membrane, muscle and connective tissue. Following the plan that one usually adopts in searching for and bringing together torn fibers of the sphincter ani muscle, in a complete tear of the latter, I picked up with a tenaculum the circular muscle fibers in the right side of the incision and then the circular muscle fibers in the left side. I observed that the diameter of the urethra was lessened when traction was made with the tenacula. A lead probe, about the diameter of the normal urethra, was passed into the bladder, and two chromic gut sutures united the muscle ends tightly about the probe.

A chromic gut stitch was now passed through the muscle, beneath the mucous membrane, the entire circumference of the urethra. The needle entered the wound on the right side, passed in a semicircle and made its exit through the mucous membrane on the upper part of the meatus; reentered the same opening; passed in a semicircle on the opposite side, and made its exit in the left side of the wound. This suture was tied with the lead probe still in position in the urethra, to prevent a too tight closure of the urethra. Four catgut sutures united the edges of the mucous membrane of the wound. The probe was now removed and a Pezzer, self-retaining catheter was passed into the bladder, to permit continuous drainage of that viscus. The catheter was removed the fourth day. The convalescence was uneventful. The patient now has complete control of the urine and has had no sign of recurrence of the prolapse of the urethra.

I have been unable to find mention of this procedure in the literature of this subject.

CONCLUSIONS

1. The cause of prolapse of the urethra is neuromuscular, namely, the loss of balance of the nerve impulses to the detrusor urethral muscle, with subsequent changes in the vascular supply to the tissues, including the adjacent glands.

2. The result is a prolapse of the urethra followed by partial paralysis and relaxation of the constrictor muscles. The treatment should consist in replacing the extruded membrane and shortening the constrictor muscles as described in the case herein reported.

ABSTRACT OF DISCUSSION

DR. GUY L. HUNNER, Baltimore: Dr. Keefe's operation certainly brings before us a simple method of dealing with what can be a very complicated condition, and what has been made a complicated condition in most of our operations in the past. I just asked Dr. Keefe whether he depended entirely on the internal sphincter of the urethra or the external. I thought from his description that he depended on shortening the internal sphincter, but seeing his illustrations made me think he was depending on shortening the external sphincters, and this he says he does. I am surprised that he should get such good results in this way. It seems to me that the same principle applied to the internal sphincter would give more certain results and would be no more complicated. It is really the operation which Hill of Mongomery, Ala., described for the inncontinence sometimes seen after childbirth. Later, Dr. Kelly reported about thirty cases, and Dr. Deaver described the same operation. The operation I have used has an incision down over the urethra to the cervix and lays the anterior vaginal wall wide open. With fine black silk sutures I reach out into the reticular tissues, a second and third bite take up the urethra and the fourth bite reaches out into the opposite side. When the suture is tied it not only tends to shorten the fibers themselves, but it infolds the urethra. The operation is generally followed by a perfect result. I have had three partial failures in about thirty cases. This operation involves about the same principles that Dr. Keefe has described, but it deals with the internal sphincter.

DR. BROOKE M. ANSPACH, Philadelphia: I take great interest in Dr. Keefe's operation because I have been using a method somewhat like it in connection with other plastic work. In cases of cystocele with relaxed pelvic floor in old women, one often finds a large, gaping urinary meatus. By inserting sutures through the tissues at the neck of the bladder as Dr. Kelly has described, the internal sphincter is tightened and by resecting the anterior orifice very much after the manner illustrated by Dr. Keefe one can turn in the exposed mucosa. I think this plan makes satisfactory control of the bladder even more certain and it relieves the

Fig. 6.—Dr. Emmett's buttonhole operation.

women of the irritation and pain which they often have from the exposed mucosa.

DR. JOHN W. KEEFE, Providence, R. I.: The operation described by Dr. Hunner, to my mind, is of value, and in some of the aggravated cases may be preferable to the operation I have described. The muscular structures about the female urethra are in excess near the bladder and near the

meatus, but there are circular muscles all the way along the urethra, besides the longitudinal muscles. The muscular structure just back of the meatus is so well developed that it alone, as has been proved by the case reported, may be sufficient to control the flow of urine. If this is so, it seems to me that the simpler the operation the better; but, if there should be a recurrence, I think then some operation on the internal sphincter or the portion of the circular muscles near the bladder may be of value. If, however, the simpler operation is sufficient, it is better, whenever possible, to employ this method.

THE PRESERVATION OF THE MENSTRUAL FUNCTION

IN DOUBLE SUPPURATIVE DISEASE OF THE TUBES AND CHRONIC METRITIS *

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The proper management of suppurative tubal disease in the young woman often taxes the judgment of even the experienced surgeon. When to operate, so as to afford the patient the greatest margin of safety, and how to operate, to obtain the best end-results, are questions that should be definitely settled. On these questions the surgeon and gynecologist, however, seem to hold different views. The gynecologist has learned from bitter experience that time alone sterilizes the tubal content and that when sufficient time is allowed, Nature is competent, to a considerable degree, to absorb and regenerate the function of many of the involved structures. We have also learned that different bacteria, each having a different life history, have a decided influence on the operative prognosis.

Simpson and I have promulgated and taught these rules as to the time for operation: 1. Radical abdominal procedure should never be done in the presence of acute tubal infections, or in acute exacerbations of chronic inflammatory conditions. 2. It takes time to sterilize the tubal content — from six weeks to three months in gonorrheal infections, and longer when the

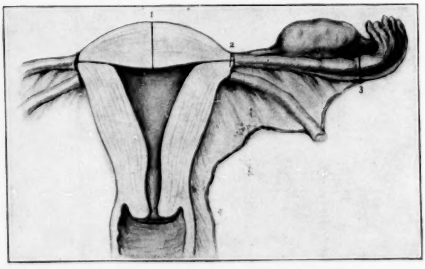

Fig. 1.—Location from which sections were taken.

streptococcus is the infecting agent. Hence, a greater period of quiescence is necessary after postabortal infections, than when the clinical course points to the gonococcus as the causative agent. 3. The morning and evening temperature must be normal for a period of at least three weeks before intervention is considered. 4. Bimanual examination of the pelvic organs must show the exudate to have disappeared, or if an exudate is present, it should be hard and insensitive and the pelvic manipulation should not be followed by an exacerbation in temperature or leukocytosis or local sensitiveness, for unless the exudate is quiescent, manipulation will squeeze the toxins into the surrounding lymphatic channels and occasion a fresh resistive reaction. Hence the importance of making comparative leukocyte and differential counts before and after bimanual examination in pelvic inflammations, for by this method we may determine the state of their activity. 5. No patient should be operated on by the abdominal route unless the leukocyte count remains at a point under 11,000, and the polymorphic leukocytes at 75 per cent. or less. Success or failure depends directly on the observance of the foregoing principles, for unless Nature has had time for resorption of the exudate and regeneration of the pelvic tissues, conservation of any of the pelvic structures is out of the question.

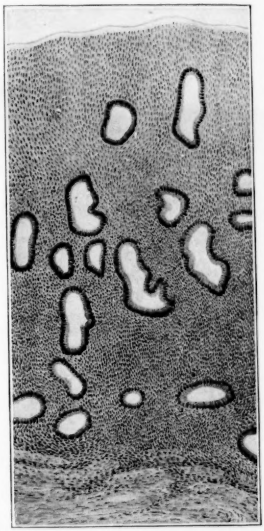

Fig. 2. — Normal endometrium from fundus uteri.

Infection of the tubes, resulting from an extension of the inflammation through the uterus, is usually bilateral, for gonorrhea involves the entire tube; hence any attempt at conservation offers but little protection against subsequent exacerbation. All of us have seen cases with one tube grossly involved, while the other, macroscopically at least, was free from disease, yet during convalescence, or while the patient was still in the hospital, the retained tube would light up and become a thick, swollen mass, adherent to the posterior surface of the uterus. It was formerly supposed that no fluid accumulation could occur in the tube until both ends were sealed, but by making serial sections through the isthmian and interstitial portions of the tube in a large series of cases, we have found that the uterine end never closes and that the apparent occlusion in the isthmian and interstitial portion is relative and not actual. This may be explained by the fact that the folding, edema and consequent swelling of the mucosa make the actual lumen so tortuous that intratubal pressure closes, or practically closes, the uterine end. If one recalls for a moment the anatomy of the interstitial portion of the tube, surrounded as it is with an inner circular muscular coat, which is continuous with the circular muscular coat of the uterus, one must be impressed with the fact that any inflammatory process of the mucosa must excite an inflam-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

matory reaction in the submucous and muscular structures immediately surrounding the mucous tube. The muscular coat, when examined microscopically, is edematous and infiltrated with inflammatory tissue cells, and in the mixed infections, particularly when the streptococcus is present, there may be found small localized abscesses in the surrounding muscle tissue. This small round tissue cell infiltration results in an increase in the connective tissue within the uterine wall and thereby actually increases the size of the uterus. Such metritic changes do not subside after the removal of the distal portion of one or both tubes.

The persistence of this infection of the uterine muscle formerly tempted the French operators to do vaginal hysterectomy with double salpingectomy, for chronic suppurative tubal infection. Many of our more conservative surgeons acknowledge that a gonorrheal infection of the tube can never be wholly cured without ablation of both tubes, and that the persistent leukorrhea, which under certain excitation regains its infective properties, and the increased amount of the menstrual flow, which with the pelvic pain makes up the clinical syndrome in these cases of chronic inflammation, are due to the enlargement and increased blood supply to the metritic uterus, and because of the persistence of these symptoms, have advocated hysterectomy when salpingectomy is done, with the retention of one or both ovaries.

While we are agreed that the retention of an infected uterus is a menace to the woman's future health, my own feeling has been that when *so much care is taken to preserve the function of ovulation, there should be like care in preserving the function of menstruation,* as ovulation without menstruation contributes little to the patient's well-being. Sections

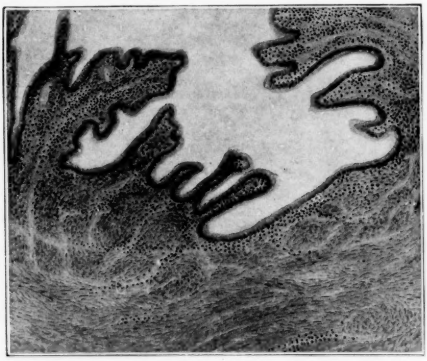

Fig. 3.—Isthmic portion of tube showing round cell infiltration at a distance from the reaction zone.

through the uterus, between the fundus and the internal os, show few if any of the pathologic changes which may be demonstrated about the pars interstitialis. It is only in the cervical region, in Naboth's glands, in the columnar epithelium of the cervical canal, in the fundal region, and in the structures surrounding the pars interstitialis that there is a persistence of the inflammatory changes described above. Therefore, it must appeal to any one of considerable clinical experience that, in a given case of chronic specific infection involving the cervix and the tubes, a cure cannot be effected, except by the removal of

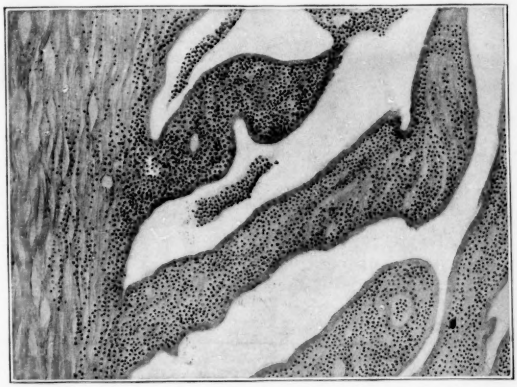

Fig. 4.—Midportion of tube showing inflammatory reaction with round cell infiltration.

these foci, and to attain this end many are doing panhysterectomy. The endocervicitis and cervicitis may be controlled by amputation or linear cauterization, but the tubal infection cannot be checked or its sequelae removed without proper attention being paid to the pars interstitialis and the structures immediately surrounding it. Clinical experience has shown that after amputation of the fallopian tubes, the stump which is left in the wall of the uterus may be a source of continued metritis and annoying discharge, or may remain the site of focal infection and cause an exudate and intestinal adhesions. Again, the stump of an amputated tube may become the seat of a tubal pregnancy, for unless the cornu is excised, the lumen of the interstitial portions may remain patent. This assertion is not theoretical, as I have seen three ectopic pregnancies in this location.

In gonorrheal infection, notwithstanding the fact that the gonococcus is primarily a surface organism, it quickly spreads to the deeper layers of the tube, and the gonococci and their toxins may escape not only through the abdominal ostia, but actually through the walls of the oviducts, and excite a local resistance in the form of a plastic exudate at these points. Ordinarily, however, the inflammatory exudate forms within the tube and escapes from the abdominal end into the peritoneal cavity and causes a perioophoritis or an adhesive peritonitis, or the abdominal ostia of the tubes may become closed and the contents be confined within the tube, distending it, resulting in a sactosalpinx, which leaks from time to time into the uterus or abdominal cavity, setting up an exacerbation of the peritoneal inflammation. Both tubal appendages are generally involved, though the infection of the one may antedate the infection of the other. Unilateral salpingitis of gonococcic origin is practically unknown. The disease involves the entire tube. Why,

then, should we leave one third of the tube, the pars interstitialis, to continue the infection? Therefore, in determining the extent of the operative procedure, too much weight cannot be given to the influence of the etiology, not only on the primary, but also on the

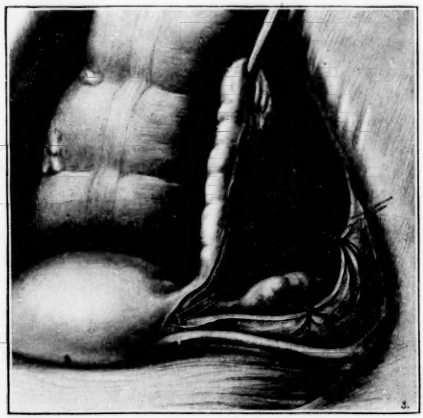

Fig. 5.—The proper way to remove a tube without interfering with the ovarian circulation.

remote prognosis in tubal infections. Hyde, in an examination of 2,973 tubes, found the contents sterile in 67 per cent. The gonococcus was recovered in 19 per cent., and mixed infections were demonstrated in 15 per cent. Krönig's bacteriologic examination of suppurating tubes practically coincides with the work done by Hyde. In his series, 61 per cent. were sterile, and the gonococcus was recovered in 21 per cent. I regard the history and clinical course with the physical findings as of the greatest significance; for when extension of a gonococcus infection occurs from the cervix to the uterus and the fallopian tubes, it usually follows close on a menstrual period, or in the second week following the emptying of a gravid uterus, or following a curretting for leukorrheal discharge (foolish as such a procedure may seem to those of us trained in gynecologic pathology). On the other hand, streptococcic infection almost invariably follows early, after abortion, delivery at term, or intra-uterine office manipulation, and the attack is always more violent. Too careful inquiry cannot be made into the history of any case, and errors in diagnosis in gynecology are better guarded against by careful history taking than by the bimanual examination, as only by the history is it possible to interpret the pelvic findings.

A clinical appreciation of these facts led me, three years ago, after witnessing the work of Beuttner in Geneva and Bell in Liverpool, to introduce into America their procedure, namely, the ablation of both tubes with the resection of the infected fundus of the uterus, leaving sufficient healthy uterine body to conserve the menstrual function and one or both ovaries to continue ovulation. Removal of the tubes and resection of the upper segment of the uterus can be done without interfering with the ovarian circulation. Hence, the ovary may be retained with a greater degree of security than if a hysterectomy is done and the uterine end of the anastomosis cut off. The ovary is the analogue of the testicle, and I believe that considerable surgical risk is justified for the preservation of an ovary, for it is well known that double oophorectomy, particularly in a young woman, may convert the normal woman into a hopeless neurasthenic. In tubal disease, the ovary is usually involved only because of its association with the infected tube. It is an ovary in bad company rather than a diseased ovary, and its function can be conserved, provided its circulation is not too much interfered with. Clinical experience justifies the attempt not only to conserve the internal secretions from the ovary, but also to maintain the menstrual function. We all know that menstruation exercises a therapeutic effect on health, which is not only psychic but actual, for the whole system is planned for this periodic outflow. The uterine mucosa undergoes definite histologic changes throughout a definite cycle which culminates in the menstrual flux. These cyclic changes are subconscious when proper correlation exists between the several governing organs of the body. We all know, however, that when this correlation is disturbed, and it is disturbed by cystic changes in the ovary, resulting when its circulation is interfered with, definite symptoms are produced in the breasts, the tonsils, the thyroid gland, the genital spot in the nasal mucous membrane, and in the circulatory and nervous systems of the individual. Consequently, there can be no question as to the desirability of the conservation of the ovarian function, provided it is associated with a periodic outflow of menstrual blood. In order to have this maintained, it is necessary to have the ovaries and uterus relatively healthy.

While it must be admitted that many uteri do recover and return to normal, or nearly so, after the amputation of the isthmian and free portion of the tubes, it is only after a long period of time, during which the menorrhagia and leukorrhea, to a greater or less degree, persist. On the other hand, there are a great number of these uteri that do not even approach a return to normal, but remain large and

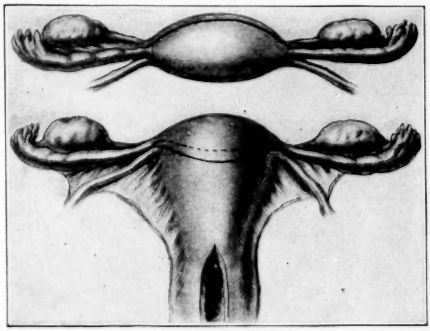

Fig. 6.—Lines of incision.

metritic. To justify the employment of a procedure which is such a radical departure from simple salpingectomy as the Bell-Beuttner operation, sufficient clinical data must be produced and the end-results must be sufficiently satisfactory as to leave no question in the mind of the reader regarding the advisability

of adopting the more extensive operation herein recommended.

All gynecologists are agreed that the ovarian circulation must be maintained in removal of the tube, if the retained ovary is to escape degenerative changes. In double salpingohysterectomy, the efferent circulation from the conserved ovary is actually obstructed. Clinical experience in our follow-up work has convinced us that after hysterectomy, when the ovary is to be retained, and its function maintained, the corresponding tube should also be left in, as only in this way is the afferent and efferent circulation maintained. Sampson's exhaustive work on the uterine and ovarian circulation leaves no doubt as to the verity of this statement. Furthermore, the frequency of cystic degeneration of ovaries left in situ after the ordinary methods of tubal ablation or after hysterectomy gives living testimony as to the practical truth of this statement.

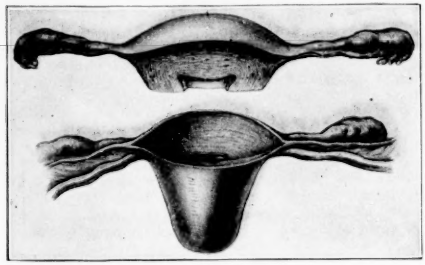

Fig. 7.—Showing wedge of fundus removed, including metritic tissue.

In removal of the fundus, by ligation of the fundal branch as it comes off from the uterine, just above the utero-ovarian anastomosis, there is no obstruction to the ovarian circulation, provided the tube is taken off by individual ligation, of the medial and intermediate branches, as the return flow is maintained by the preservation of the pampiniform plexus.

The technic of the Bell-Beuttner procedure depends on the ligation of the individual branch supplying the tube and uterine fundus. With the bleeding controlled, a wedge-shaped excision is made of the upper part of the body and fundus of the uterus. The anterior incision begins just posterior to the insertion of the round ligament and runs across the front of the uterus to a corresponding point on the opposite side. The posterior incision begins between the tubal insertion and the ovarian ligament on one side and extends across the posterior surface to the same point on the opposite side. The incision is made in such a manner that the entire fundal mucosa with the pars interstitialis and surrounding tissues of both sides are excised. The uterine flaps are then brought together with interrupted catgut sutures with superficial sutures between the deeper ones. This wound is then peritonealized after the manner of Rossini by reflecting the bladder above the line of incision, and the abdominal wound is closed in the usual manner. This anteverts the uterus. The convalescence is usually smooth and uneventful. Of twenty cases in which operation was performed by this technic, two patients have had infected wounds, and one a diffuse bilateral parametritis. In the last seventeen cases the recovery has been smooth and complete, the uterus being small, well anteverted and freely movable at the time of discharge. All but two of these twenty cases have been followed for periods of from two months to three years. Since the operation, all patients menstruate regularly and painlessly and have free pelves. Only one has a leukorrheal discharge.

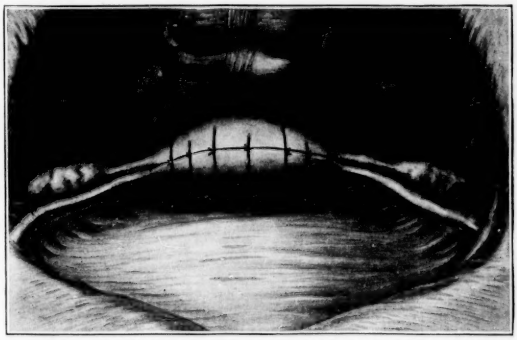

Fig. 8—Fundal wound closed; ovaries suspended by round ligament.

CONCLUSIONS

1. The number of sacrificial operations in young women may be materially reduced by giving Nature time to absorb exudate, sterilize tubal contents and regenerate function.

2. For chronic tubal disease, especially where the gonococci or streptococci are concerned, simple ablation does not remove enough of the diseased tissue. Menorrhagia and leukorrhea persist and the tubal stump becomes a focus for continued infection.

3. While hysterectomy in chronic pelvic inflammatory disease may effect a cure, the conserved ovary quickly loses its function, as the circulation is frequently impaired and even its internal secretion is short lived.

4. It should be the aim of the gynecologist to preserve both ovulation and menstruation.

5. The ovarian circulation can be maintained and the menstrual function preserved by the employment of this technic.

6. The after-results in this series of cases justify its further trial.

287 Clinton Avenue.

ABSTRACT OF DISCUSSION

DR. E. E. MONTGOMERY, Philadelphia: Dr. Polak has spoken of the frequency with which these inflammations subside and the importance of retaining the functions of ovulation and menstruation. One of the difficulties is that of keeping these patients under supervision. Many of them have others dependent on their care and they are obliged to get back to their duties promptly. A second difficulty is the limited number of beds in the great majority of our hospitals, for their treatment requires that the most expeditious procedure must be employed. I have subjected a number of these patients to operation immediately after the subsidence of the more acute

symptoms, by abdominal incision, through which adhesions are separated and the peritoneal cavity protected from the spread of infection by gauze packing; the tube from whose abdominal end seropurulent fluid is flowing is seized and wrapped with a pad of gauze and forcibly milked, squeezing out the purulent fluid and exudation, and in several cases I have seen uncomplicated convalescence follow with regularity of menstruation and hope of procreation.

DR. BERTHA VAN HOOSEN, Chicago: I think it is important that young women should have the menstrual period preserved, and by leaving the circulation so that the menstrual period is preserved it does much to give the woman speedy relief from the infection. My operation is much like Dr. Polak's. The first step is practically the same. The next step is to put the angiotribe on the uterus. It is practically impossible to include the muscularis in closing the angiotribe, but the peritoneum will be drawn by it over to the side and the uterine muscularis will be pushed toward the middle line. In this way the ureter is pushed to one side; another angiotribe is put in front so that the ureter is pushed still farther out of the way and a little more peritoneum is included in the grasp of the forceps; the same is done on the other side. The peritoneum is incised from just above the bladder line up to the horn of the uterus, because the peritoneum is very adherent to the body of the uterus. The peritoneum is lifted from the uterus by a simple pull with a tenaculum. When the uterus is entirely separated down to the internal os, a dissecting scissors is slipped in and the mucosa of the cervix and enough of the underlying muscularis to include the glands are cut. In this way none of the arteries is interfered with except the very small vessels. The parts are then closed, one stitch being put through the cervical portion anteroposteriorly. The clamp is taken off the part nearest to the middle, and with a silk suture union is made to the fundus. In none of my cases has there been a death.

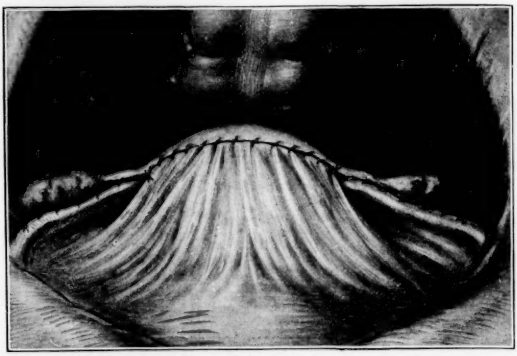

Fig. 9.—Fundal wound peritonealized by reflecting the peritoneum of bladder over it.

DR. H. J. BOLDT, New York: Dr. Polak's words are a verification of the stand which I took many years ago. With regard to further conception, I cannot say that I have had the same experience that Dr. Montgomery has had, since I have not seen any of my patients conceive subsequent to surgical intervention of that kind.

DR. HARVEY P. JACK, Hornell, N. Y.: At our New York State meeting in Utica I detailed an operation looking to preservation of the childbearing function in these cases. It will not always, perhaps not often, succeed, but it is worth trying on its results, even at the slight risk of being compelled to operate again. After I had read my paper at Utica several men came to me and reported successful results as to childbearing as a consequence of conservative work on the tubes. Some of these patients are known to recover and regain the childbearing function without any surgery, so that I think it is time we halted in our efforts, in many of these cases, to do ideal surgery and try to do practical surgery.

DR. R. H. C. GIBBONS, New York: I have never taken stock in these "conservative" operations, although I have done many of them. Many patients who have had "conservative operations"—tube, ovary and appendix removed—have not recovered their health. When the uterus is badly infected it should be taken out in greater part; also the appendages.

DR. HENRY O. MARCY, Boston: This subject has fluctuated back and forth through the years. We should place more emphasis on the conditions for which we operate. It is the character of the infection one should think of quite as much as the location. If the tubes are in the condition referred to by the author of the paper, it is unwise to preserve them. On the other hand, it is wise to be conservative in that one is dealing with that which is important, not to the individual alone, but to the race.

DR. JOHN OSBORN POLAK, Brooklyn: I wish to disclaim any originality for the conception of this operation, as the principles involved were conceived and published by Blair Bell of Liverpool and Beuttner of Geneva. Only the perfected technic regarding the circulation of the ovary has been developed by me. With regard to the remarks of Drs. Montgomery and Jack, their discussion is irrelevant, as they are speaking of another class of cases, cases which we all know time will regenerate and in which function will be reestablished. Before describing this operation I showed two slides on the screen which even my friend Dr. Jack must admit are beyond conservation. This operation is only advocated in the class of cases in which the ordinary operator does a double salpingectomy with panhysterectomy, conserving one or both ovaries, with an interfered-with circulation for their internal secretion. Our follow-up work has shown us that the retained ovary after hysterectomy becomes cystic, the seat of adhesions, and that its life history regarding internal secretion is very limited, because its efferent circulation is interfered with.

Two classes of cases have been discussed, one in which the patient will in time get well without operation or at most with the formation of adhesions; the other in which the pathology is so great that nothing short of ablation of the diseased structures will effect a cure. It is in these that I am striving to save the menstrual function as well as the ovarian secretion.

Child Labor Day.—It has been customary each year to designate the fourth Saturday, Sunday and Monday for observance as child labor days in the churches, synagogues, schools and clubs of the country. For 1918 the days designated by the National Child Labor Committee are January 26, 27 and 28. The observance of these dates as Child Labor Days has been approved by Secretary of War Baker, Commissioner Claxton of the United States Bureau of Education, Miss Julia C. Lathrop of the Children's Bureau and Owen R. Lovejoy, general secretary of the National Child Labor Committee, and the officials of many other organizations. To furnish material for programs the National Child Labor Committee is distributing pamphlets dealing with the war situation and with child labor and educational problems in general. Secretary Baker, in endorsing the plans for the observance of the days, said: "The ravages of hostilities bear heavily indeed on the present generation, but we must not permit the effects of it to be visited on the children of the nation. The tribulations borne by the present should make us conserve to as great a degree as possible the health and energies of the coming generations."

CHOLECYSTECTOMY WITHOUT DRAINAGE *

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At this time gallbladder surgery is occupying the attention of surgeons perhaps more than any other subject. The reason for its prominence is obvious. Cholecystostomy, once the operation of choice, has been denounced by an able coterie of surgeons as giving permanent results in not more than half of the cases; and cholecystectomy, a supposedly more dangerous operation, is being substituted for it whenever conditions allow.

All are familiar with the condition found at operation after a previous cholecystostomy. Often the liver is turned up at its lower border and lies on a level with or above the costal margin, having diaphragmatic and peritoneal adhesions. The duodenum, transverse colon and stomach are often adherent to the gallbladder and the liver. I believe this is due entirely to the drainage, which does not allow the liver to assume its normal position, and which, in my opinion, is responsible for the adhesions to the other structures. In

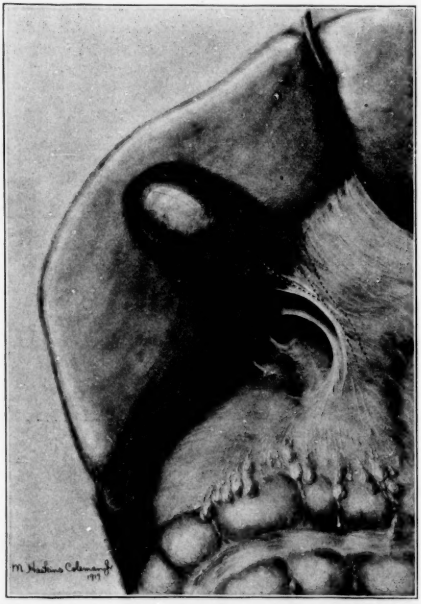

Fig. 1.—Relations of cystic duct to common duct. Dotted lines indicate direction of incision in hepatoduodenal ligament.

every case in which I have done a cholecystostomy and later gone back into the abdominal cavity, I have found a mass of adhesions about the gallbladder. In fact, I have never seen, in secondary operations elsewhere in the abdomen, the same number and density of adhesions. I have never found a case which did not have this condition. It is impossible for me to state from my operative observation how

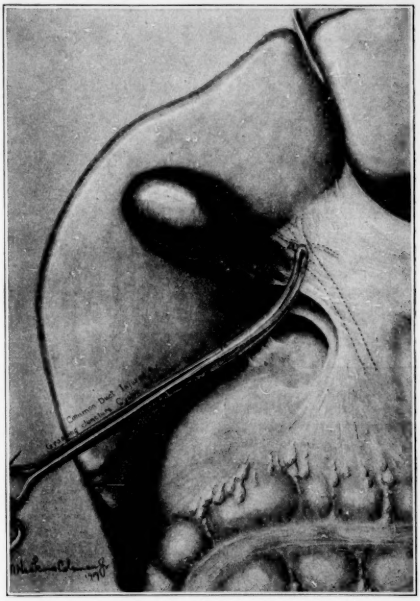

Fig. 2.—Method generally employed. When making sure of the cystic duct, the curved artery clamp is apt to grasp and injure the common duct as well.

many adhesions form about the gallbladder region after a cholecystectomy without drainage, as I have never had occasion to reopen the abdomen in such cases. I feel confident that fewer adhesions would be found associated with a more normal condition of this region. I am sure, however, that this result will be obtained only with careful removal, allowing no bile to escape into the cavity.

In some recent experiments by Dr. Budd and myself, we were able to demonstrate that presumably healthy bile, if spilled in the region of the gallbladder, would produce a moderate amount of adhesions, and that bile infected with the colon and typhoid bacillus would produce extensive adhesions. We were also able to show that infected bile spilled in the region of the gallbladder, plus drainage, were followed by even more extensive adhesions. We removed gallbladders without liberating bile in the cavity, closing without drainage, and in these cases the number of adhesions was negligible.

About five years ago, we were first impressed with the number of cases of cholecystectomy which never leaked any bile through the drain after operation. We began, in carefully selected cases, to close without drainage, and found that excellent results followed. We began to enlarge more and more on this group,

* Read before the Maryland Medical and Chirurgical Society, Baltimore, April 25, 1917.

until now we remove quite a large percentage of gallbladders without drainage. We do not believe that all cases can be closed without a drain, but do contend that a big percentage can be done in this way, provided,

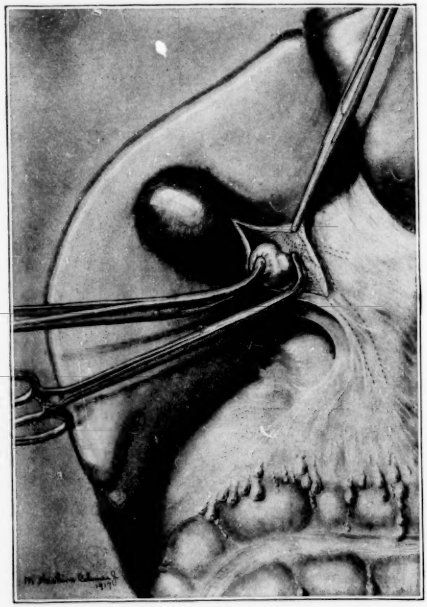

Fig. 3.—Incision made in hepatoduodenal ligament. Pouch of gallbladder rotated up, and right angle clamp placed on cystic duct and artery.

of course, the surgeon is careful to spill no bile in the cavity and to leave no bleeding surfaces.

We believe that the technic of the removal of the gallbladder, whether from the fundus down or from below upward, is largely a matter of each surgeon's preference as to the method by which he can best control the situation. I myself believe that the removal from below toward the fundus offers the greatest advantages.

OPERATIVE TECHNIC

Using the right rectus incision curving at the upper end toward the xiphoid, we bring the gallbladder at once into view. Rotating the liver upward, we make an incision in the hepatoduodenal ligament, as shown by the dotted line in Figure 1, and by blunt dissection bring the cystic duct into the field.

The method generally employed is to place a curved clamp over this ligament, as shown in Figure 2. We believe that this in itself is responsible for many reported injuries to the common duct in cholecystectomy, as the clamp, in being placed sufficiently far to assure the grasping of cystic duct and artery, is liable to grip the common duct as well. There is also a possibility of a ligature being put through or around the common duct when the cystic duct is tied off, or of the scissors injuring it when the cystic duct is cut. It is to be borne in mind that the cystic duct does not join the common duct at right angles in a great many instances, but runs parallel to it and right alongside.

We believe that this accident is obviated absolutely in our method. Grasping the pelvis of the gallbladder and pulling upward, we are able to apply a right angle clamp on the cystic duct and artery, as shown in Figure 3. Figure 4 illustrates what we have found to be the usual relations of the cystic duct to the pelvis of the gallbladder, certainly in pathologic conditions. Then, a No. 2 catgut ligature is placed around the cystic duct close up to the junction with the common duct, and we are careful to cause no stricture of the latter. We thus avoid leaving sufficient cystic duct to form a bud in which future trouble is liable to occur. Another ligature is now placed around the cystic duct and artery, and the two are cut (Fig. 5). By blunt dissection with the back of the knife and the finger, the gallbladder is dissected back to the fundus, care being taken to leave the peritoneal coat of the liver intact. The gallbladder is removed, sufficient peritoneum being allowed to remain to close the space

Fig. 4. — Semischematic view illustrating the usual relations of cystic duct to pelvis of gallbladder.

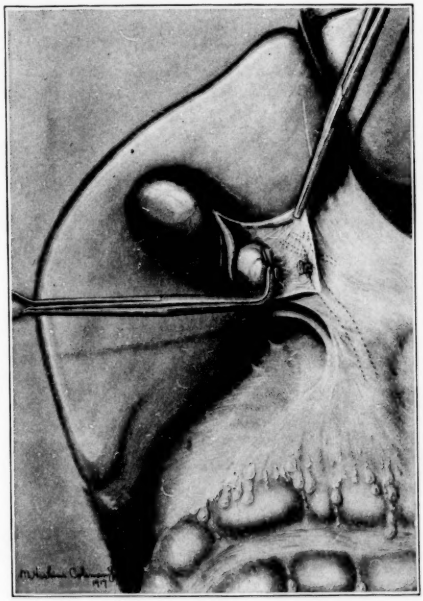

Fig. 5.—Ligature placed around cystic duct, also around cystic duct and artery close to common duct, and cut.

without tension. A crown suture is placed through the peritoneum and under the stump of the cystic duct, being brought back over the stump and tied, as shown in Figure 6. This drops the stump back in the liga-

ment, and a continuous suture closes all raw surfaces and leaves a clean field, as shown in Figure 7. We then close without drainage, and have no fear that bile will escape into the peritoneal cavity.

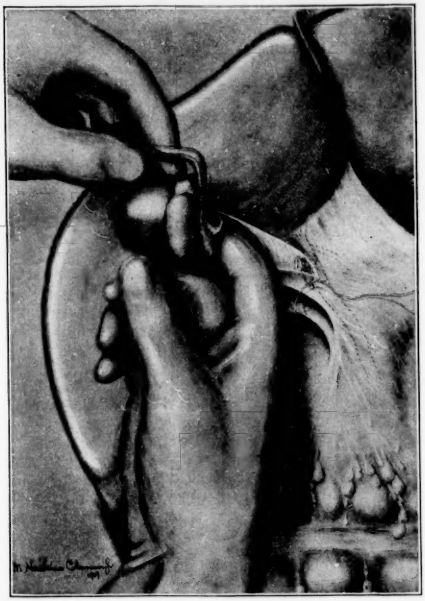

Fig. 6.—Crown suture in place under and over cystic stump. Gallbladder being dissected back to fundus.

RESULTS OF OPERATIONS

Our experience in surgery of the gallbladder is based on 549 operations for cholelithiasis and cholecystitis with twelve deaths, or 2.2 per cent. In this series, 466 patients, or 86 per cent., had gallstones in the bladder or duct; eighty-two patients, or 14 per cent., had no gallstones, but showed various stages of cholecystitis. There were 398 cholecystostomies with seven deaths, or 1.7 per cent., and 107 cholecystectomies with one death, or 0.9 per cent. In thirty-eight of our cholecystectomies, we left no drainage. It was in this group that the one death occurred. There were forty-four choledochotomies with four deaths, practically 9 per cent.

There were twenty-six secondary operations. Twenty-one followed the operation of cholecystostomy and five occurred after choledochotomy. Gallstones were found in twelve of the secondary operations; seven in the cholecystostomy and in all five of the choledochotomy group.

This series presents several interesting facts. The women outnumbered the men five to one. The percentage of deaths in the common duct cases was about five times as great as the mortality in other gallbladder work. The causes of death in the common duct group were secondary hemorrhage and infection. The mortality in our cholecystectomies is much lower than in the cholecystostomies. This is due to the fact that cholecystectomy on the whole was performed in the more favorable type of case.

The patient lost in our cholecystectomy group was a woman aged 66 with a simple case of cholelithiasis. The gallbladder was ruptured during removal. Drainage was not used, as we were able to cover the raw surface and clean out the peritoneal cavity. She had urinary suppression, and died three days after operation. At necropsy a small abscess was found between the liver and transverse colon, and an acute nephritis was revealed. There was no evidence of the escape of bile. It is impossible to say whether she died from acute nephritis or an infection; but in future, under similar circumstances, we shall drain.

It should be borne in mind that this mortality represents the patients who have died in the hospital after operation on the gallbladder. Some of these patients undoubtedly died of causes other than those which can be attributed to the immediate effect of the operation, but, because of the fact that they died in the hospital, we have included them in the gallbladder mortality.

CONCLUSIONS

1. Cholecystectomy for simple infections of the gallbladder is a most successful operation, especially if this can be done without soiling the peritoneum by the contents of the gallbladder, and closing without drainage. 2. Adhesions of organs which normally have a certain amount of mobility cause postoperative complaints, especially in the gallbladder region, and we feel that any operation which will limit these is certainly a step in the right direction.

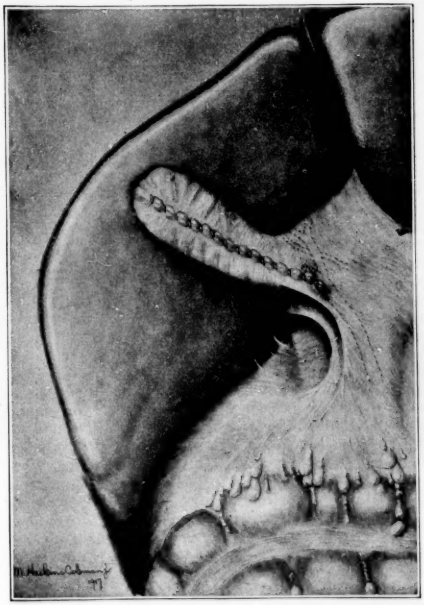

Fig. 7.—All raw surfaces covered, and clear field left ready to close without drainage.

PIGMENTATION OF THE HIND-GUT

A PATHOLOGIC AND EXPERIMENTAL STUDY *

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The presentation of a paper based on the observation of a small number of cases must justify itself by dealing with a rare condition or by demonstrating new facts concerning a well known subject. With the advance of intestinal surgery, and the increasing number of "developmental reconstructions" and other operations which involve removal of the cecum and part or all of the first portion of the hind-gut, we are able to note with more frequency a pigmentation or melanosis of the mucosa of both organs. This pigmentation may or may not be transitory; but the rarity of its observation at the necropsy table, and the fact that at times a fading of color may be noted through the proctoscope, lead to the supposition that, in not all cases at least, is it macroscopically permanent.

PATHOLOGY

Gross Pathology.—Both the gross pathology and the histopathology of pigmentation of the hind-gut have been so clearly given by Pick that any subsequent description of the tissue changes observed must of necessity follow him closely in detail, if not in phraseology. Macroscopic appearance of the intestinal mucosa in pigmentation of the hind-gut not only varies with the amount of pigment present, but is evidently influenced to a certain extent by the manner in which the tissue is handled. In tissue removed at operation, the color is materially affected by congestion which follows clamping, and in three cases here cited pigmentation was revealed only by microscopic examination. This factor may to some extent be responsible for the infrequent recognition of pigmentation of the hind-gut at time of operation and divert such tissue from the laboratory to the furnace of the unscientific hospital. In such portions of the hind-gut as may be observed by means of the proctoscope, the color varies from gray-black to light brown, or it may have the mottled "toad's back" appearance mentioned by Pick. Two specimens of the present series which were removed at operation and included the ileocecal valve, cecum and ascending colon were uniform gray-black or mottled throughout. Pick has described the mucous membrane as being mottled like a toad's back, and noted the following variations in color: "The tint may become a little lighter in diffuse spots of the mucosa, or in an entire segment, passing from a deep black into a lighter shade of brown." He further notes that there may or may not be a failing of melanosis toward the rectum. On these minor points my observations are not entirely in accord with those of Pick. In the one case seen at necropsy there was an even tar-black pigmentation from ileocecal valve to rectum; in the other cases, even shading throughout the specimen. It is natural that the influence of postmortem change should be thought of, but the specimen of this series was secured within two hours after death, and it is not probable that such a factor would be overlooked by Berlin's most astute pathologist. A cut section of the intestinal wall may show a thin brown or black line corresponding to the mucosa, or the surface may exhibit nothing indicative of pigmentation. There is variation in thickness from that of tissue paper to somewhat more than normal. Extreme thinness is confined to the cecum and is, of course, a condition frequently noted in long standing cases of intestinal stasis. The serosa shows no change. In Case A, the mesenteric glands of the mesocolon were darkened. In Case A, the abdominal organs, as in the cases of Pick and other observers, were free from pigment.

Microscopic Pathology.—When the intestinal wall has markedly thinned, there is, of course, a diminution in the depth of the gland pits; otherwise they appear to maintain their normal depth. The cells lining the glands may be somewhat increased in size, they may present a normal appearance, or they may be somewhat smaller than normal. The goblet cells are neither increased or diminished in number, nor do cells foreign to this layer appear. The connective tissue of the mucosa is not affected except in the very thin intestines, where it appears to have undergone some degree of atrophy. In the connective tissue of the mucosa, between the basement membrane of the gland epithelium and the muscularis of the mucosa, are observed a varying number of pigment cells. These cells may be arranged in a uniform layer and lie close to and follow the basement membrane of the epithelium, or scattered through the stroma of the mucosa. The cells vary in size from 7 to 20 microns and have a single round or oval concentric nucleus. Such pigment as they contain is not uniform either in size of granules or in color. Some cells are gorged with large light or dark brown granules, while others hold dust-fine, saffron-colored particles. There is also a certain amount of free pigment in the form of isolated granules or clumps of granules, though the clumps of granules may be pigment cells so overloaded with pigment as to obscure their cell bodies. The pigment cells resemble morphologically the plasma cell found normally in this locality, though Pick considers them connective tissue cells of the tunica propria, and Henschen and Bergstrand regard them as several types of the wandering class of connective tissue cells of the stroma of the mucosa. Sections of two ileocecal valves showed pigment to stop at a midpoint in the valve, the ileac side being pigment free. Large numbers of eosinophils may at times be seen in the mucosa, and in Case A an occasional ameboid-looking body was noted, but the character of these bodies could not be determined. The last tissue examined exhibited pigmentation of the distal end of the ileum.

Submucosa: In several cases pigment cells were found in the solitary lymph nodes, and occasionally a cell can be seen beneath the muscularis, which is in contradistinction to the description of Pick, but has been noted by Henschen and Bergstrand. The muscular walls and serosa were free of pigment cells, and neither I nor my colleague, Dr. Jeffries, could note microscopic change worthy of mention other than occasional atrophy. Mesenteric glands: In Case A, pigment cells corresponding in every way with those of the mucosa could be seen. These cells appeared to be principally gathered on one side of the gland in a position probably corresponding to the junction of the afferent duct.

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

Chemical Examination.—It would be of no avail to chronicle in detail a series of failures. All solvents and dyestuffs which I could think of, or which were suggested by the experiments of others, gave negative results. Hence, if deduction can be drawn from negative results, the pigment, from its resistance, must resemble the melanin group.

NATURE OF THE PIGMENT

Pigments relating to intestinal pigmentation fall naturally into two groups—exogenous and endogenous. Of exogenous pigments but little need be said, they being, as a rule, salts of either silver or mercury, easily accounted for in the clinical history of the patient and demonstrated without difficulty by chemical and microchemical methods. Endogenous pigments present a much more difficult problem for consideration, and it is practically impossible to confine such considerations to any specific pigment or group of pigments. Von Gierke[12] says one can divide endogenous pigments into two great groups, those derived from blood pigment (hemoglobin pigments) and those formed from other body substances through cell activity (autogenous pigments). If one follows the classification of Heuck, endogenous pigments encountered in the body may be divided into the hemoglobin pigments and the autochthonous pigments. Further subdivision separates the hemoglobin pigments into three groups, malarial pigment, hematoidin and hemosiderin. The autochthonous pigments include the fat-containing abnutzungspigment and the melanin. In contradistinction to the classification of Heuck, and as illustration of the diversity of opinion on the subject of body pigments, may be quoted the following somewhat broad definition by Adami.[13] In the paragraph dealing with "modified hemoglobin," Adami speaks of a succession of modifications of the hemoglobin pigment "hematin," leading to the eventual deposit in tissue of two, or more correctly, three substances, hematoidin, hemosiderin and hemofuscin. Further, Stengel and Fox[14] say that consideration of hematogenous pigment "concerns the deposition of pigments derived from hemoglobin, of which there are two groups, the siderous and the nonsiderous. The chief siderous pigment is hemosiderin, which has, however, many modifications; the nonsiderous pigments are derivatives of hematin-hematoidin, hemafuscin, melanin, etc." Heuck, on the other hand, does not think that hemosiderin is derived from hematoidin, nor does he consider hemofuscin one of the pigments coming from coloring matter of the blood but rather belonging to that class of pigments originating from lipoid substance and in consequence being an abnutzungspigment identical with the lipofuscin of Borst. As to the derivation of melanin or melanins, von Furth, according to Adami, regards them as being developed by the action of intracellular oxidases (tyrosinase) on the aromatic chromogen group of the protein molecule.

As it is not necessary here to regard malarial pigment, the chemical composition of only two of the blood pigments need be considered, following the classification of Heuck. Concerning the exact nature of these pigments and the chemical processes involved in their formation there is much controversy. Their characteristics in general, however, are as follows: Hematoidin is a red or brownish gold, crystalline or granular substance, dissolved in concentrated sulphuric and nitric acids and distorted by alkalies; its iron reaction is negative. Hemosiderin is a golden yellow to brown, granular or flaky substance, soluble in acids but insoluble in alkalies; its iron reaction is positive. The definition of abnutzungspigmenten or lipoid pigments given by von Gierke is that by such are understood a class of granular, golden brown pigments that give a lipoid reaction. As illustrations he mentions pigment found in heart muscle, liver, seminal vesicles, etc., which may be normally present or occur in diseased tissue. Heuck describes it as a golden brown, flaky substance insoluble in acids or alkalis; its iron reaction is negative; it is always positive to basic dyes and irregularly positive to fat dyes. Hammersten,[15] in writing of melanins, says that there are some forms which are slightly soluble, and others easily soluble, in alkalis. He mentions choroid pigment as an example of sulphur-free melanin. Others mention melanin as a substance containing a minimal amount of iron but a relatively considerable quantity of sulphur. According to Heuck's table, melanin is a substance occurring in the form of brown crystals or flakes; it is insoluble in acids and alkalis and does not take any stains which are used for the identification of abnutzungspigment.

Fig. 1.—Pigmentation of the ileum: *A, A,* gland; *B, B,* pigment cells; *C,* muscularis mucosa; *D,* submucosa; pigment cells in submucosa. (Photograph by Dr. Wightman.)

For the identification of pigments, one must consider the morphologic, michrochemical and staining

12. Von Gierke, E., in Aschoff, Ludwig: Pathologische Anatomie, 1911, **1.**
13. Adami, J. G.: Principles of Pathology, 1910, **1.**
14. Stengel and Fox: A Textbook of Pathology, 1915.
15. Hammersten, Olaf: A Textbook of Physiological Chemistry, Mandel, 1900.

characteristics. Morphologic characteristics include form and color of pigment substances. Microchemical reactions pertain to solubility in acids and alkalis of varying strengths and at different temperatures which may be applied for a few minutes or allowed to act for several months. Staining characteristics are ascertained by treatment (both before and after tissue has been subjected to the action of acids and alkalis) with the basic dyes, Nile blue and neutral red, and the various dyes for the differentiation of fats such as are mentioned by Schmorl,[16] or in any similar book which deals with chemical and microchemical methods of treating tissues. Summed up, the information one obtains concerning the nature of pigments found within the intestinal wall is based principally on three factors, namely, the solubility of the pigment, its iron content, and its ability to take dyestuffs both before and after treatment with acids, alikalies and other chemical substances.

THEORIES CONCERNIG INTESTINAL PIGMENTATION

Limiting this matter to the views of those men who have had the most extensive opportunities for observation of pigmentation of the hind-gut, it is necessary to consider only the opinions of Solger, Pick, Heuck, Henschen and Bergstrand, and Lynch.

Solger appears to have been influenced to a marked extent by the location of the pigment, which he noted as confined exclusively to the tunica propria of the mucosa, the solitary follicles being spared. Although the reactions for iron yielded no very clear results, he considered it necessary, on the basis of the microscopic picture, to assume that the pigment was derived from blood chromatin, especially on account of the resemblance of the pigment deposits to the granular cells observed in the surrounding bloody deposits. Topographic relation of the pigment deposits corresponded with the vascular distribution, more particularly of the small veins. Hence the assumption of stasis in these vessels as a probable cause of pigment formation, though why pigment should show a predilection for the mucosa of the large intestine was not clear.

Pick agrees with Solger as to the distribution of pigment. He, however, noted that it was for the most part contained within cell bodies, and on this is based the hypothesis of his theory of pigment production. By microchemical tests Pick was able to exclude iron from the composition of intestinal pigment, but the presence of iron and a not inconsiderable quantity of sulphur was indicated by michrochemical examinations. According to his experiments, the pigment did not appear to be a blood derivative in its chemical properties but to belong rather to the class of true melanins. The melanins of melanosis of the large intestine originate, according to Pick, from the aromatic albumin-disintegration products of the contents of the large intestine (indol, skatol), under the influence of an oxidative ferment, resembling tyrosinase, produced by the connective tissue cells of the mucosa. The capacity for production of this ferment is apparently individual. Indol and skatol are transformed into true melanin, in the connective tissue cells, by way of absorption in the mucosa. This interpretation renders intelligible the otherwise inexplicable limitation of the disease to the large intestine, on the one hand, and to the mucosa with its connective tissue cells, on the other.

16. Schmorl, G.: Untersuchungsmethoden, 1914.

Heuck agrees with Solger as to the pigment location and notes, as did Pick, the pigment cells. He considers the condition a true melanosis, and was able in one instance to examine an intestine which exhibited both true melanosis and pseudomelanosis. The pigment he assumes to be "propigment" between true melanin and lipofuscin, though perhaps more closely allied to the latter. It is, as he thinks, a fat pigment normally present in the intestine and increased in quantity through the action of some unknown agent. Why it should be confined to the large intestine, or as to the nature of the pigment cells, he expresses no opinion.

Henschen and Bergstrand consider the pigment to be between a true melanin and abnutzungspigment. They do not agree with the foregoing observers regarding either the limitation of pigment to the large intestine or to the mucosa of the large intestine. In one or two cases noted by them, pigment was found not only in the solitary follicles but also in the glands of the mesocolon. Pick's theory of pigment formation by connective tissue cells of the tunica propria does not appeal to them as a tenable one. Chronic obstipation being an almost invariable symptom, they regard it as an important etiologic factor. Their supposition is that on the hypothesis of absorption or elimination the eitology of the condition will eventually be worked out.

The theory of Lynch is interesting not only from its variance with those before considered, but because it is the result of deductions drawn from a study of the literature on the subject up to the article of Heuck, combined with opportunity for observation of the living tissue. Lynch, who prefers the term "hemachromatosis" for the designation of intestinal pigmentation, says he is inclined to think that "hemachromatosis is of bacterial origin; that the extent of the disease is dependent upon the severity of the infection; that the probable source of infection is the intestinal tract, possibly starting as an intestinal putrefaction; that this putrefaction lowers the vitality of the tissues, and thereby the cells of the mucous membrane lose their protective properties; consequently bacteria find ready access to the portal circulation. As a result of this, the chromogenic function of the liver is interfered with, and the liver becomes surfeited with pigment and is not capable of abstracting iron from the hemoglobin, with the result that an excessive amount of pigment is circulating in the blood. Further, the cells of the intestine probably have a selective action for these pigments, and as a consequence they are deposited in the tissue, etc. These pigments may or may not give a reaction for iron."

ETIOLOGY OF INTESTINAL PIGMENTATION

The theory of Solger, in view of subsequent researches by Pick, Heuck, Henschen and Bergstrand, hardly appears to merit consideration. Plausible as at first seem the hypotheses of Pick, they will hardly bear analysis. It is well known that indol (Combe[17]) is produced in the small intestine, and although Pick was without doubt aware of this fact, he must, to make his contention of the limitation of pigment to the hind-gut plausible, assume indol to be an exclusive product of the large intestine. That indol is not an important etiologic factor is indicated by the rarity of pigmentation in the terminal portion of the ileum

17. Combe, A.: Autointoxication, States, 1908.

where indol and skatol are produced in large quantities. Henschen and Bergstrand are not able to understand, and with reason, why, even if the first part of Pick's theory were correct, he should assume a connective tissue cell of the tunica propria to be elected for the complicated metabolic process of pigment making. They contend that not a single cell, but several cells of the wandering type of connective tissue cell, are the ones in which pigment is seen. Their supposition is based on variation in the shape of the cell bodies and on the presence of more than one nucleus in some cells. Neither Pick nor I have been able to note other than mononucleated pigment cells, nor could any variation in the form of cell bodies be considered due to other than distortion by pigment granules.

Concerning the nature of pigment, opinion does not diverge as widely as would seem apparent at first glance. With the exception of Lynch, all agree that it does not appear to be a blood pigment. Pick, Heuck, Henschen and Bergstrand agree that it resembles a melanin, and Heuck and Henschen and Bergstrand consider it of the abnutzungs class between melanin and fat-containing pigment. Heuck thinks that it resembles more the latter. In this status it will probably remain until new or more refined methods of chemical analysis can be applied to this particular problem.

Fig. 2.—Pigmentation of gland of mesocolon: *A*, normal tissue; *B*, pigment cells; *C*, granular nature of pigment. (Photograph by Dr. Wightman.)

There is some degree of satisfaction in the contemplation of conclusions regarding the nature of intestinal pigment. Unfortunately, not so much comfort can be derived from theories concerning its etiology. When one considers the problem, it resolves itself into the following questions: What is the nature of the pigment; what produces it; why is the pigment confined principally to the mucosa of the hind-gut; why is the pigment contained principally in cells; why is chronic obstipation an almost invariable accompaniment of pigmentation? Concerning the first question there is nothing to add to the exhaustive analyses of Heuck and Henschen and Bergstrand, and that the pigment substance belongs to a group between the true melanins and the fat-containing pigments appears conclusive. That a ferment is active in pigment production is in accord with the theory of Pick and not entirely at variance with the opinions of Henschen and Bergstrand, who incline toward an absorption or excretion theory. In considering absorption and secretion as factors, it is, so far as our present knowledge of the function of the hind-gut is concerned, reasonable to assume that absorption plays a more important rôle than secretion. It must not be forgotten, however, that though the physiologists tell us that secretions from the hind-gut contain no distinctive enzymes and are composed principally of water, it has been clearly demonstrated by Draper[18] and others that under abnormal conditions intestinal mucosa is capable of assuming utterly foreign secretory functions. In support of the absorption factor is the possible action of a variety of decomposition products from putrefactive processes which are accentuated by chronic obstipation. These processes, while usually pronounced in the cecum and hind-gut, may, under certain conditions, be also present in the terminal portion of the ileum. That the substance responsible for the production of pigment in the hind-gut is related in a measure to the so-called tyrosinase, is, in view of the proved nature of intestinal pigment, a not illogical conclusion. The fact that the condition is principally confined to the large intestine supports the assumption that conditions for the production of the tyrosinase-like body are most favorable in that locality. I believe that putrefaction of the contents of the cecum and hind-gut, so invariably an accompaniment of chronic intestinal stasis, is the most important contributing factor. This assumption is based not only on the fact that chronic obstipation is almost without exception observed in individuals whose colons exhibit pigmentation, but also on the statement of Lynch that he had noted a diminution of the optically visible pigment to be coincident with relief of chronic obstipation, and, in consequence, permanent acceleration of the fecal current. I further consider it probable that the pigment-producing ferment is formed principally in the cecum, and that pigment is manufactured by such intestinal mucosa as comes into contact with and absorbs this ferment. Henschen and Bergstrand have shown that part of the ileum may be pigmented, and I have examined two such tissues. Both intestines were removed from individuals that had numerous peritoneal adhesions which confined the distal portion of the ileum in such a manner that stagnation of the fecal current took place to a degree usually confined to the cecum and hind-gut.

Involvement of the cecal half of the ileocecal valve would further strengthen the view that only such mucosa as comes into contact with the pigment-forming ferment will be found to contain pigment. It does not, however, seem probable that this ferment has an intracellular action. It is more probable that it acts on the intercellular substance, of which there is a comparative abundance in this locality. Such an assumption in a measure accords with the conten-

18. Draper, J. W. (Maury): Am. Jour. Med. Sc., 1909; Experimental Intestinal Obstruction, THE JOURNAL A. M. A., Oct. 21, 1911, p. 1338.

tion of Heuck that we are merely observing an increase of a normally present pigment. From the position of the vast majority of pigment cells it would appear that the ferment acts with rapidity on the first intercellular substance which it encounters after passing the basement membrane. In support of this theory it must be remembered that in the mucosa of the cecum and hind-gut we are not dealing with as highly specialized tissue as that of the liver or of the kidney, but with a tissue whose even passive function has been considered by some as anatomically and physiologically nonessential. As the cecal and colonic mucosas are practically passive walls through which fluids pass, it is more probable that the action of the pigment-producing ferment is on intercellular substances and fluids and not on intracellular substance of any cell or group of cells. The variation in pigment building capacity mentioned by Pick should depend more on duration and intensity of stasis than on difference of individual property to produce pigment-forming enzyme. This is supported by the statements of Henschen and Bergstrand regarding the number of pigmented intestines they encountered in individuals past 40, and by my experience with intestines removed because of chronic intestinal stasis.

Pigment cells are, in my opinion, plasma cells which have acquired visible phagocytic properties. These cells are found in considerable numbers in the stroma of the mucosa; and the cells studied appeared to be morphogically nearer the plasma cell than any other found in the locality. By arrangement of the pigment-containing cells, it would appear that the plasma cells attempt to follow the action of the white cells, which become phagocytes, and to form a protecting wall against further invasion by pigment-producing enzyme, in addition to removing the pigment. Were it possible to follow microscopically the change accompanying permanent acceleration of the fecal current, one could no doubt observe, coincident with decrease of pigment-forming enzymes, a gradual assimilation of pigment granules, as suggested by the experience of Lynch. Migratory properties of the plasma cell carry it to different parts of the connective tissue stroma, and at times to and beyond the muscularis. Those pigment cells seen in the solitary follicles and in lymph nodes of the mesocolon may be accounted for by the migratory properties of the cell or by the effort of the lymphatic system at removal of waste products.

The theory of Lynch is so at variance with that of other writers that it must be considered apart. It should be of material interest to the reader because of the unusual opportunity for the clinical observation on which it is partially based. I, however, cannot consistently reconcile Lynch's idea of the effect of bacterial infection with the number of nonpigmented but severely infected hind-guts which I have had the privilege of examining for him. Furthermore, it is difficult to understand why a selective action for intestinal pigments should be conferred almost uniformly on cells of the connective tissue stroma of the hind-gut.

REPORT OF CASES

SERVICE OF DR. LYNCH

CASE 1.—Mrs. M., aged 45, had had obstipation for ten years. An operation for developmental reconstruction was performed. Tissue examination revealed pigmentation confined to the mucosa of the hind-gut. The solitary nodules were pigment free. There was no change in other intestinal walls.

CASE 2.—Mrs. O., aged 50, exhibited symptoms which Dr. Lynch associates with pigmentation of the hind-gut. There was prolonged constipation, toxemia, urine at times free from indican, and blood in the stools. Proctoscopic examination revealed ocher-colored pigment extending from the anus to the sigmoid. Tissue examination of bit snipped through the proctoscope revealed pigmentation of the mucosa. The appendix exhibited pigmentation of the mucosa.

SERVICE OF DR. DRAPER

CASE 3.—Mrs. R., aged 44, had severe hemicrania averaging fifty a year, together with severe congenital constipation. An operation for developmental reconstruction was performed. Tissue examination revealed pigmentation confined to the mucosa. The lymph nodes were free. There was pigmentation of the cecal half of the iliac valve. There was no change in the muscle walls.

CASE 4.—Mrs. B., aged 34, had mild mental obsessions and marked depression, with severe congenital constipation. An operation for developmental reconstruction was performed. Tissue examination revealed no pigmentation of the ileum. The cecal half of the ileocecal valve was pigmented. There was pigmentation of the mucosa of the cecum and the hind-gut. Solitary follicles were pigment free. There was no change in the muscle walls. The lymph nodes of the mesocolon were pigment free.

CASE 5.—Mrs. R., aged 55, had chronic constipation for twenty years. An operation for developmental reconstruction was performed. Tissue examination revealed pigmentation of the mucosa only. There was no change in the muscle walls.

CASE 6.—Mr. A., aged 60, had profound toxemia. Obstipation had existed for twenty years. An operation for developmental reconstruction was performed. Tissue examination revealed pigmentation of the terminal portion of the ileum and the entire hind-gut. Pigment involved the solitary follicles as well as the mucosa, extended into the submucosa, and was to be found in the lymph nodes of the mesocolon. There was marked atrophy of the muscle walls.

SERVICE OF DR. BAINBRIDGE

CASE 7.—Mr. M., aged 36, was always constipated. Colectomy was performed. Tissue examination revealed the ileum pigment free. Pigment was confined to the mucosa of the cecum and hind-gut. There was some atrophy of the muscle walls. As an interesting side light on the toxicity of cecal contents in these cases a cubic centimeter of such, from this case, was injected into the peritoneal cavity of a 250 gm. guinea-pig and caused his death in two hours, the symptoms being those of profound toxemia.

SERVICE OF DR. MEEKER

CASE 8.—Mrs. W., aged 42, was troubled with prolonged constipation, etc. Colectomy was performed. Tissue examination revealed profuse pigmentation of the mucosa of the terminal portion of the ileum; also pigment in the solitary follicles and the submucosa.

Three other pigmented intestines are not mentioned in this group because of insufficient clinical data. Of the twelve intestines examined after operation for chronic intestinal stasis, eleven were pigmented. Not including appendixes, we have examined 206 intestinal tissues in our laboratory in the past five years. The foregoing eleven were the only pigmented ones which came to our notice.

COMMENT

It would appear that pigmentation of the hind-gut is a condition dependent on chronic intestinal stasis rather than incident to it. That it is a result, and not a primary contributing cause of obstipation, is indicated by consideration of clinical data in conjunction with histologic findings in tissue obtained both at necropsy and from the operating table. The influence of pigment, after formation, on the normal physiologic function of the hind-gut is, as are most phases

of this problem, a matter on which one is compelled to theorize because of inability to establish facts. Physiology of the hind-gut does not brilliantly illumine the pages of standard textbooks. Other than that the hind-gut serves as a connecting link between the small intestine and rectum and that it absorbs to a certain extent, and secretes a watery enzyme-free fluid, there is but little information pertaining to its functions. That both absorptive and secretory functions should bear directly on the degree of obstipation is understood when one takes into consideration their influence on consistency of fecal mass, lubrication of the intestinal mucosa, and effect on bacterial action. It is, of course, impossible to more than conjecture how materially normal functions of the mucosa are retarded by the presence of pigment. A study, however, of the position of many of the pigment cells would indicate that their interference must be a considerable one. So characteristic was the position of the majority of the cells to Solger, that, noting how they followed the peripheral line of vessels, he attributed pigmentation to circulatory disturbances.

If one recalls for a moment the normal histology of the mucosa of the cecum and hind-gut, he will remember that it is roughly as follows: (*a*) a single layer of columnar epithelial cells resting on a basement membrane; (*b*) connective tissue stroma containing central arteries, veins, lymphatic stem and nerves, with fine branches spreading from the central vessels and anastomosing directly beneath the basement membrane; (*c*) muscularis mucosa composed of a thin layer of muscle fibers separating the mucosa from the submucosa. With this histologic picture in mind, it must be conceded that a foreign substance in greater or less abundance when interposed between anastomosing branches of terminal blood vessels and between or in lymph spaces, mechanically at least, interferes with the normal performance of the functions of these parts.

If secretions are diminished there is a coincident loss of moisture to the fecal mass and defective lubrication of the mucous membrane. This has been graphically described by Lynch in his protoscopic picture of a dry mucous membrane covered with sticky fecal masses. If absorption is retarded, fats which would otherwise pass through the intestinal wall remain within the cavity and both promote and accelerate bacterial decomposition. On the other hand, however, with retarded absorption, there would be less fluid withdrawn from the fecal mass, though this might be a feature of small importance, owing to the turbidity of the fecal current and the consequent extended period during which absorption can take place.

In both the pigmented and nonpigmented cecum and adjacent hind-gut, during chronic intestinal stasis, there appears first to occur a congestion and edema of the mucosa, accompanied by congestion manifest in all blood vessels throughout the several intestinal walls. Following this phase, if the condition persists, there occurs a very slow but progressive atrophy not only of the mucosa but of all walls of the intestine. (By this I do not wish to convey the impression that atrophy continues until fibrous tissue ultimately replaces the normal structures. In no tissue which I have studied was there an absence of any of the normal coats of the intestinal wall, even though they had been extensively thinned out.) Not considering senile atrophy, we may presume these changes to be due, first, to an irritation of the mucosa which may be either chemical or mechanical and is probably both. After the preliminary irritation, there begins a gradual overdistention followed by loss of tonicity through constant stretching, and disturbance of circulation from pressure of gut content and compression by gut walls. It is more logical to attribute such changes to the causes mentioned than to suppose them to be due to the presence of pigment in the mucosa, though the possibility of a toxic element derived from pigment is within the bounds of speculation.

CONCLUSIONS

If the foregoing premises are correct, it is possible to draw the following conclusions:

1. In true melanosis of the hind-gut, the pigment is not derived from blood pigment, but is a substance between true melanin and fat pigment.

2. This pigment is probably formed by an enzyme which, manufactured by the intestinal contents, acts on the intercellular substance of the stroma of the intestinal mucosa.

3. Pigment-containing cells are derived from plasma cells of the stroma of the intestinal mucosa.

4. Intestinal pigment is primarily an accompaniment and not a cause of chronic obstipation.

5. The clinical significance of intestinal pigmentation concerns the duration and intensity of obstipation, and, while a contributing influence in established obstipation, is not an initial etiologic factor.

ABSTRACT OF DISCUSSION

DR. R. A. LAMBERT, New York: By what method of examination did Dr. Lynch note the disappearance of the pigment in the three cases which he studied?

DR. ALFRED F. HESS, New York: Does the pigmentation occur in children, or only in adults?

DR. JAMES EWING, New York: I have encountered pigmentation of the large intestine somewhat frequently and I think that small amounts of this condition are not so uncommon as Dr. McFarland's references to the literature would indicate. I recall one rather pronounced case in a physician who suffered from chronic anemia and long continued obstipation. The entire large intestine was dark brown. He also suffered from a peculiar degeneration of the voluntary muscle system and of the peripheral nervous system, the exact designation of which puzzled our New York neurologists. We interpreted the intestinal condition as the result of the chronic intestinal obstipation and intoxication.

DR. JOHN W. DRAPER, New York: I had the pleasure, in connection with Dr. Lynch, of furnishing a part of the tissues from which these studies were made. I know nothing of the origin of the pigment excepting what I have learned from the study of Dr. McFarland's paper. We have observed clinically one important matter—the improvement in the cases operated on has in a general way been proportionate to the amount of pigment present. It may be, therefore, that the presence of the pigment, which in most cases was easily discoverable when the abdomen was opened, may be an index of value for the operating surgeon.

DR. JEROME M. LYNCH, New York: I have been studying this question for five years and am sorry that I can throw but little light on the origin of bowel pigmentation. I have seen a comparatively large number of patients. They are all very toxic, constipated, bleed from the bowel occasionally and have severe periodic headaches. The toxicity is relieved if the bowels are kept open, and the pigment gradually disappears if irrigations are continued over a long period. The pigment varies from an ochre to a black shade and is sometimes divided into rectangular blocks. It is an interesting problem, and I hope that this paper may lead to further study and information on this important subject.

DR. W. LANDRUM MCFARLAND, New York: The observations of Dr. Lynch in regard to the disappearance of the pigment were made with the proctoscope. He saw the discolorization of the intestine—the usual picture before the treatment, and the disappearance as the patients were treated—just as you would the fading out of anything that is decolorized. Of course his observations were macroscopic. The youngest case that I have seen on record was that of a person 16 years of age. The worst pigmentations were in persons over 40. The remarks of Dr. Ewing were interesting. The Germans think the condition rare; the Swedes do not. Eight out of the eleven intestines that were sent to me have shown pigmentation, so I do not consider it a rare condition.

WHEN IS CANCER OPERABLE?*

J. WALTER VAUGHAN, M.D.
DETROIT

During the past ten years, my assistants and I have experimented with many various substances in the hope of throwing some light on a better understanding of the cancer problem.

The work[1] first reported contained a brief case report on the use of vaccines prepared from cancer protein, and later publications[2] gave reports of various scientific findings as they were encountered during the progress of this study.

Other workers, notably Blumenthal[3] and Lünchenbein,[4] have reported clinical observations which corresponded to those that I had previously reported. From a scientific standpoint, the work of Gruner[5] agrees with changes I have observed chiefly in advanced malignancy, while of decided corroborative value is the research of Murphy,[6] showing the effect of spleen destruction on the transplantability of tumors.

Indeed, the literature on the subject of malignancy abounds with isolated observations made by many independent investigators which, when taken collectively, all point toward the verification of the conclusions reached by me from my own investigations.

While these investigations have not added much of decided value to the solution of the cancer problem from the standpoint of ultimate control of the disease, yet they have contributed much toward what I might term its intelligent treatment, and they have given us an exact knowledge as to when operative treatment is indicated, as well as to when such treatment will shorten life rather than prolong it.

Obviously it would occupy too much time to give in detail the mass of experimental work that has been done before the facts, on which the following conclusions are based, were elicited. However, these have all been published before, and the references to such publications are appended, so I will occupy the time by a simple statement of the facts, together with a brief report of the conclusions that must be deduced from them.

Metchnikoff, in his classical work on phagocytosis, was the first to show that tissue cells when introduced into the animal body were ingested by the type of large mononuclear leukocyte that is formed in the spleen. At this time, owing to the importance of his observations on the rôle of the polymorphonuclear leukocyte in bacterial infections, but little attention was paid to his observations on the large mononuclear cell, and he himself never associated this cell with any protective function in malignancy.

The next work calling attention to this endothelial blood cell of splenic origin, and the first associating it with the protective apparatus against malignancy, was that performed by my assistants and myself.[7] Altogether we have done over 30,000 differential blood counts and have ascertained that there is invariably an increase in large mononuclear leukocytes following the injection of cancer protein into normal persons or animals.

The percentage of increase is dependent on certain factors, chief among which is the number of body cells with which the protein comes into contact.

Thus a subcutaneous injection is followed by a slight increase, an intravenous injection by a greater increase, and the intraperitoneal method gives a still greater increase.

Another important factor is that the sensitizing dose should not be too large—from 5 to 10 minims of a 0.5 to 1 per cent. solution or suspension of either residue or vaccine is sufficient.

This increase in percentage of large lymphocytes is of short duration, lasting from about four to twenty-four hours. During this time the animal is sensitized to large intravenous doses of the protein; but such sensitization is lost when the increase in large mononuclear cells again recedes.

At the time these observations were first made, I was working under the mistaken impression that this reaction was specific for cancer tissue; but the work of Fischera[8] helped to show this to be untrue.

Fischera was experimenting with fetal autolysate in the treatment of malignancy, and had reported decided clinical benefit in some cases. I immediately started blood counts following injections of fetal autolysate, placental residue, and tissue vaccines from every source, and obtained results of decided interest.

Chief among these was the fact that the more the tissues used reverted to the embryologic type, the greater was the increase in large lymphocytes following its injection. This forced me to the conclusion that we were not dealing with a specific ferment but with a general proteolytic ferment produced by the larger mononuclear leukocytes which is specific only to a limited degree.

This also explained why residues or vaccines made from some forms of malignant tumors gave but a slight increase in large mononuclear cells after injection, while others gave an increase of from 200 to 300 per cent. A careful study of many tumors in this way indicated that the more the tumor reverted to the

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Vaughan, J. W.: Some Modern Ideas of Cancer, THE JOURNAL A. M. A., May 7, 1910, p. 1510.

2. Vaughan, J. W.: Sensitization in Cancer, New York Med. Jour., May 21, 1910; Blood Changes Caused by the Hypodermic Administration of the Cancer Proteid, THE JOURNAL A. M. A., Nov. 16, 1912, p. 1764; Cancer Vaccine and Anticancer Globulins as an Aid in the Surgical Treatment of Malignancy, ibid., Oct. 10, 1914, p. 1258. Vaughan, V. C.; Vaughan, V. C., Jr., and Vaughan, J. W.: Proteid Split Products in Relation to Immunity and Disease, Philadelphia, Lea & Febiger.

3. Blumenthal: Berl. klin. Wchnschr., **59**, 2333.

4. Lünchenbein: Zur Behandlung maligner Geschwülste, München. med. Wchnschr., Jan. 6, 1914.

5. Gruner: A Study of the Changes Met With in the Leukocytes in Certain Cases of Malignant Disease, Brit. Jour. Surg., January, 1916, p. 506.

6. Murphy, J. B., and Norton, J. J.: The Effect of Roentgen Ray on the Resistance to Cancer in Mice, Science, 1915, n. s., **42**, 842; The Lymphocyte as a Factor in the Natural and Induced Resistance to Transplanted Cancer, Proc. Nat. Acad. Sc., 1915.

7. Vaughan, J. Walter: Surgery of the Spleen, Harper Hosp. Bull., May, 1917.

8. Fischera: Aktiv. Immunisierung oder histogene Chemotherapie, Ztschr. f. Krebsforsch, 1914, **14**, 566-577.

embryologic type, the greater was the resulting increase.

For this reason it was thought best that a tissue which invariably gave a decided increase when properly prepared should always be used; a residue made from normal placental tissue was found to answer the requirements most satisfactorily.

Consequently we now always use this substance in our tests for the activity of the malignant immune mechanism, unless we have been particularly fortunate in obtaining an extremely malignant sarcoma.

Without going more into detail, it can be quite definitely stated that the immune mechanism in malignancy is a ferment which is formed in the large mononuclear leukocyte. This particular type of blood cell is of splenic origin or arises from similar tissues, notably the hemolymph glands and possibly the bone marrow under certain conditions.

A study of the blood findings in cases of all stages of malignancy was next undertaken. This series comprises over 200 cases ranging from the earliest diagnosable lesion to the most advanced cases, and when added to a survey of 10,000 previous daily counts on patients in all stages of this disease, it furnished some very interesting data.

In general, it may be stated that cases of early malignancy usually show a decided decrease in the total number of polymorphonuclear leukocytes with a corresponding increase in mononuclear cells.

Thus the differential count in early cancer closely resembles that seen in exophthalmic goiter, syphilis and tuberculosis, the percentage of polymorphonuclear cells being frequently much below 60.

When a tumor is growing rapidly, and always after metastasis has taken place, the percentage of polymorphonuclear cells runs above 70, and is usually much higher.

The differential count in early malignancy frequently varies considerably from day to day, and more decided changes are noticed at longer intervals.

When a high percentage of large mononuclear cells is noted for several days in succession, the tumor retrogresses during that period. Conversely, when the count shows a high percentage of polymorphonuclear cells for a continued period, it signifies rapid tumor growth. Indeed, during such periods, the microscopic character of the tumor cells occasionally assumes a more malignant type. This is evidenced in a case in which the first tissue was removed from the thyroid gland when the differential count was: polymorphonuclears, 50 per cent.; large mononuclears, 12 per cent.; small mononuclears, 38 per cent.; eosinophils 0, and the section shows a carcinoma simplex. The second section was taken from the same individual when the count was running: polymorphonuclears, 85 per cent.; large mononuclears, 2 per cent.; small mononuclears, 13 per cent.; eosinophils, 0, and shows what might have been called a spindle cell sarcoma. Such an apparent change in tumor morphology has been observed in four different instances.

The study of this large series of blood counts, besides furnishing the foregoing scientific data, revealed one fact of decided clinical importance, namely, that metastasis does not usually occur until the percentage of polymorphonuclear cells becomes high and remains so. In other words, metastasis does not occur until the immune mechanism has broken down and is no longer capable of being stimulated to renewed function.

Neighboring lymph glands may be slightly involved while the immune mechanism is still intact, but no advanced metastasis can occur during this period.

From this it can be seen that if the first differential leukocyte count in any case of malignancy shows a high large mononuclear count and a low polymorphonuclear count, we can conclude that metastasis has not occurred, and that the case is operable.

If the count shows a high polymorphonuclear and a low mononuclear percentage then we have at our disposal the wherewithal to test whether the immune mechanism has been destroyed or whether it is simply an interval of increased tumor growth. This is ascertained by injecting about 1 c.c. of placental residue intraperitoneally into the patient, and taking daily differential blood counts thereafter.

A twenty-four to forty-eight hour decrease in polymorphonuclear cells signifies that the immune mechanism is still intact and that metastasis has not occurred and therefore that the case is operable. No change, or an increase in polymorphonuclear cells with a corresponding decrease in large cells, shows inoperability because of metastasis. Such patients actually receive harm and their end is hastened by surgical intervention, unless such a procedure is indicated for palliative reasons.

In order to better illustrate this point let me cite two cases that were clinically similar in every respect. They were both cases of gastric carcinoma, apparently of advanced type, and the roentgenologist reported both inoperable.

CASE 1 (235).—Carcinoma of stomach. Hemoglobin, 70 per cent. Differential leukocyte count: polymorphonuclears, 75 per cent.; large mononuclears, 6 per cent.; small mononuclears, 18 per cent.; eosinophils, 0; mast cells, 1 per cent.

Injection of placental residue, twenty-four hour count: polymorphonuclears, 82 per cent.; large mononuclears, 3 per cent.; small mononuclears, 15 per cent.

CASE 2 (241).—Carcinoma of stomach. Hemoglobin, 40 per cent. Polymorphonuclears, 70 per cent.; large mononuclears, 6 per cent.; small mononuclears, 23 per cent.; eosinophils, 1 per cent.

Injection of placental residue, twenty-four hour count: polymorphonuclears, 59 per cent.; large mononuclears, 15 per cent.; small mononuclears, 25 per cent.; mast cells, 1 per cent.

The test in Case 1 showed that the immune mechanism was destroyed, and therefore the diagnosis of metastasis present was made.

Operation was performed for obstruction, and a posterior gastro-enterostomy was made. At this time, liver metastasis and extensive lymph gland involvement were found, and the postmortem two months later revealed extensive retroperitoneal involvement, both suprarenals being almost destroyed.

Case 2, which clinically appeared much farther advanced owing to the severe secondary anemia, showed a decided decrease in polymorphonuclear cells following injection, and an increase in large lymphocytes. From this the low hemoglobin was attributed to slow hemorrhage, since the test showed the immune mechanism to be intact, and a diagnosis of no metastasis was made. At operation a small growth obstructing the pylorus was found, and a radical operation was performed. No metastasis was observed. The lymph glands of the lesser curvature were decidedly enlarged, but microscopic section of these showed them to be inflammatory and that no metastasis was present.

We have followed the foregoing routine in over 200 cases, and I feel justified from the uniformity of our observations in stating that if the test shows the immune mechanism to be intact, operative treatment is indicated. Conversely, if the test shows the immune mechanism to be destroyed, operation is useless except for palliative reasons.

Again, I believe that operation is best performed when the percentage of large mononuclear cells is high, as metastasis is less liable to occur from the operative handling if the anticancer ferment is active when the operation is performed.

One more word concerning the value of this test: It is a valuable prognostic aid. After complete destruction of the immune mechanism, which may occur occasionally when the initial tumor is small, the progress of the disease is always rapid, and operation in such cases is usually followed by rapid general metastasis, while many cases, apparently far advanced, will respond to stimulation of the immune mechanism. Such patients always live much longer than the physician anticipates, unless he is particularly guarded in his prognosis. It is this class of case, with the alternating periods of retrogression and advancement of growth, that furnishes the fruitful field for the work of the charlatan, since the temporary benefit observed from Nature's efforts is usually attributed to whatever medication is being used at the time.

ABSTRACT OF DISCUSSION

DR. HENRY SCHMITZ, Chicago: I made the assertion some time ago, and again here in discussing Dr. Levin's paper, that in the study and treatment of carcinoma we should take into consideration the leukocytic and the differential white blood corpuscle count. By these the value or uselessness of different therapeutic measures could be shown. If, for example, following the use of a certain therapeutic measure, there were a decrease in the red and the white blood count, we should wait until the blood returned to normal before making another attempt to treat the patient. If the decrease persists, further treatment would be useless. This is specially true in the radium and roentgen treatment of cancer. Persistence of leukopenia indicates the hopelessness of the treatment. Additional exposures to the rays merely render the patient and the tumor worse. I therefore feel that the observations of Dr. Vaughan are of inestimable value, not only in the determination of operability, and the prognosis of surgical treatment of carcinoma, but also of the palliative treatment. On my return home I shall immediately begin a study of my work from Vaughan's standpoint and see whether I can substantiate his deductions.

DR. SAMUEL W. BANDLER, New York: I am delighted to hear the word immunity introduced in the study of carcinoma. I believe the preventive study will be along the line of immunity—determining why some of us have it and others do not. It would be interesting also in families to study whether the tendency to carcinoma is a characteristic of more than one member of the family or only of the person who has the disease. I have known histories in which the father has had carcinoma, in which three children have died in infancy; one adult child of that father has tuberculosis; another adult daughter has carcinoma of the stomach at the age of 37; another adult daughter has carcinoma of the colon at the age of 34. Circumstances such as that point absolutely to a lack of resistance in that family, which takes the form of carcinoma in the majority, of tuberculosis in one, and death in infancy or childhood in the others. It would be interesting to see in these cases whether there is a familial change in the blood and in the relation of the cells in other members of the family than the one with carcinoma. I would ask whether Dr. Vaughan has made studies of the same sort in benign tumors of various parts of the body, pointing to immunity in one individual and a lack of it in another. In women who have been pregnant we find in a certain proportion the development of hydatid mole, or an overgrowth of cells which are supposed to atrophy and disappear, showing a lack of protection or resistance in that individual.

DR. J. WALTER VAUGHAN, Detroit: The only studies we made with benign tumors were in making extracts from the tumors and testing out their power to increase the percentage of large mononuclear cells. The more the tissue cells revert to embryologic type, the higher the increase—from 6 to 10 per cent. I am glad that the point has been brought out that the repeated differential blood count is of the utmost importance and gives us more aid clinically than any other examination.

RELATION OF VITAL CAPACITY OF LUNGS TO CLINICAL CONDITION OF PATIENTS WITH HEART DISEASE *

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In most persons with heart disease, dyspnea is one of the earliest symptoms observed, and the tendency of a patient to become short of breath on exertion bears a close relation to his clinical condition. The physician often asks of his patient, "Do you get short of breath easily?" or "Do you get short of breath more easily than you did formerly?" and thereby indicates that he regards the question of dyspnea as having a direct bearing on the functional state of the heart. An increasing tendency to dyspnea is evidence of a failing cardiac reserve, while the ability to perform a greater amount of exercise without becoming short of breath indicates, in general, an improvement in the efficiency of the heart. In a limited number of patients, palpitation or cardiac pain are the presenting symptoms, and dyspnea does not assume so prominent a rôle, but in a much larger group the onset of respiratory distress is the first symptom which suggests that the subject is approaching the limit of the functional capacity of his heart.

On account of the importance of the tendency to dyspnea as an index of the clinical condition of the patient, we not infrequently attempt to standardize it or describe it in our records, so that we may know more or less accurately whether it is increasing, decreasing or remaining constant. Unless, however, careful observations are made on the patient while he is undergoing graduated exercises, one has little but the patient's own statement to rely on, and such observations concerning subjective symptoms are, of course, apt to be extremely vague and unreliable. It would be of considerable assistance, therefore, if we could devise some objective method of measuring accurately the tendency to dyspnea. The latter it seems possible to do in the determination of the vital capacity of the lungs.

As a result of a study of the various elements which take part in the production of dyspnea in heart disease, it was found that perhaps the most significant feature was the inability to breathe deeply. When a person

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exerts himself, as by walking or running, the metabolism becomes increased, the oxygen consumption is raised, and in order to meet the need for additional oxygen, the rate and depth of respiration are increased. The normal subject accomplishes this without difficulty, since he can easily breathe many times deeper than he does while he is at rest; but for the patient with severe heart disease, it is quite a different problem, for the amount to which he can increase the depth of his respiration is much restricted. If one measures the vital capacity of the lungs of such a patient, and this is the volume of air which he can expire after the deepest possible inspiration, it will be found to be much below the normal. The importance of this inability to breathe deeply, which manifests itself as a decrease in the vital capacity of the lungs, is shown still further by the fact that there is a close relationship between the degree of the decrease in vital capacity and the degree of the tendency to dyspnea. Observations reported elsewhere on 124 patients [1] and many subsequent observations confirm this fact. If the volume of the vital capacity is expressed in terms of the percentage of normal values determined according to sex and height,[2] it has been found that the following generalizations are approximately true: Cardiac patients with a vital capacity of 90 per cent. or more of the normal standards have no more tendency to dyspnea than is to be found in a similar group of healthy persons. Cardiac patients with a vital capacity of from 70 to 90 per cent. of the normal almost invariably give a history of becoming short of breath on moderate exertion, but most of them can lead a satisfactory although somewhat limited life. Patients with heart disease who have a vital capacity which is only from 40 to 70 per cent. of the normal are much more restricted. Practically all become short of breath easily, and few are able to do even the lightest work. They are borderline cases and frequently become acutely decompensated. Those patients with a vital capacity which is below 40 per cent. of the normal standard are acutely decompensated, usually confined to bed, and are often dyspneic even while at complete rest.

It having been shown that there is a direct relation between a decrease in the vital capacity of the lungs and the clinical condition of cardiac patients even when one compares the vital capacity of the individual case to more or less arbitrarily chosen normal standards, it seemed worth while to find out whether this relation between vital capacity and clinical condition would not be even more striking if frequent observations were made in the same case. In a considerable

1. Peabody and Wentworth: Arch. Int. Med., September, 1917, p. 443.

TABLE 1.—VITAL CAPACITY DURING PROGRESS OF CARDIAC DISEASE

Case	Date	Vital Capacity		Condition	Remarks
		C.c.	%		
1 Med. No. 6165 Chronic myocarditis Auricular fibrillation	2/20	1,825	65	.....	Comfortable while at rest in bed. Lungs clear
	2/21	1,875	66	Stationary	Subjective improvement
	2/24	1,825	65	Stationary	
	2/27	1,800	68	Stationary	
	3/ 1	1,560	53	Worse	Hydrothorax has developed since last observation
	3/ 4	1,600	56	Stationary	Hydrothorax present
	3/ 5	1,500	56	Stationary	Hydrothorax present
	3/12	1,575	56	Stationary	Hydrothorax present
	3/16	1,500	56	Stationary	Hydrothorax present
	4/ 4	1,450	51	Stationary	Hydrothorax present
	4/ 6	1,300	50	Stationary	
	4/10	1,250	44	Worse	Increased dyspnea
	4/19	1,000	35	Worse	Dyspnea and cough
	4/20	1,200	42	Stationary	
	4/23	1,400	50	Improved	Dyspnea has gone; no pulse deficit
	4/30	1,200	42	Stationary	
	5/11	1,400	50	Stationary	
	5/17	1,400	50	Stationary	No change since April 23; still in bed
2 Med. No. 6274 Chronic myocarditis	3/13	1,700	35	.....	Badly decompensated anasarca
	3/14	1,900	39	Stationary	
	3/16	1,900	39	Stationary	
	3/19	1,700	35	Stationary	
	3/22	1,900	39	Stationary	
	3/26	2,000	42	Improved	Less edema of legs; less dyspnea
	3/31	1,950	41	Stationary	
	4/ 4	2,050	43	Stationary	
	4/ 6	2,000	42	Stationary	
	4/10	2,200	48	Improved	Less edema of legs; less hydrothorax
	4/17	2,275	47	Improved	Less edema of legs
	4/20	2,200	46	Stationary	
	4/23	2,400	50	Stationary	
	4/27	2,500	52	Stationary	
	4/30	2,400	50	Stationary	
	5/ 2	2,500	52	Stationary	Slow but steady improvement occurred throughout stay in hospital
	5/ 5	2,400	50	Stationary	
	5/ 7	2,400	50	Stationary	
	5/ 9	2,500	52	Stationary	
	5/15	2,500	52	Stationary	
	5/17	2,700	56	Improved	Slight edema of shins; right hydrothorax; out of bed but very much restricted
3 Med. No. 6194 Chronic myocarditis	3/ 5	1,850	46	.....	Badly decompensated anasarca
	3/ 7	1,900	48	Stationary	Badly decompensated anasarca
	3/14	2,000	50	Stationary	Badly decompensated anasarca
	3/26	1,600	40	Worse	Badly decompensated anasarca; more dyspnea
	4/ 4	1,800	45	Stationary	Anasarca
	4/10	1,575	39	Worse	Anasarca; more dyspnea
	5/ 5	1,600	40	Stationary	Anasarca
	5/10	1,800	45	Stationary	Anasarca; still in bed

TABLE 1.—VITAL CAPACITY DURING PROGRESS OF CARDIAC DISEASE—Continued

Case	Date	Vital Capacity		Condition	Remarks
		C.c.	%		
4 Mitral stenosis Tricuspid insufficiency	2/10	2,100	43	.....	Enlarged liver; acutely decompensated; anasarca
	2/12	2,130	45	Stationary	
	2/14	3,000	62	Improved	Less ascites; liver less tender
	2/19	3,500	73	Improved	Liver not tender
	2/27	3,100	65	Worse	Slight increased dyspnea; dry cough
	3/ 1	2,575	54	Worse	Increased dyspnea;
	3/ 3	2,700	56	Stationary	liver slightly tender;
	3/ 5	2,400	50	Stationary	increased ascites
	3/ 8	2,200	46	Stationary	No change clinically
	3/12	2,650	55	Improved	Cough stopped and
	3/16	3,100	64	Stationary	edema is less
	3/19	2,750	53	Stationary	
	3/22	2,700	56	Stationary	
	3/26	2,500	32	Stationary	
	3/31	2,800	58	Improved	No dyspnea; less
	4/ 4	3,200	67	Improved	ascites
	4/ 6	3,400	71	Stationary	No ascites; no dyspnea
	4/10	3,100	65	Stationary	
	4/13	3,400	71	Stationary	Left hospital in fair condition
5 Med. No. 6317 Chronic myocarditis	3/23	2,000	41	.....	Ascites; hydrothorax; orthopnea
	3/24	1,950	40	Stationary	
	3/26	2,200	46	Improved	No ascites; less dyspnea
	3/31	2,200	46	Improved	Less edema; no hydrothorax
	4/ 4	2,150	45	Stationary	
	4/ 6	2,200	46	Stationary	
	4/10	2,300	48	Stationary	
	4/17	2,500	52	Stationary	
	4/23	2,800	58	Improved	Signs unchanged, but looks better
	4/27	2,700	56	Stationary	
	5/ 2	2,500	52	Stationary	
	5/ 5	2,100	44	Worse	Edema of legs; liver large and tender
	5/ 7	2,300	48	Stationary	
	5/ 9	2,300	48	Stationary	Left hosptal, but gets short of breath very easily

2. The normal values for the vital capacity of the lungs are: Males: Height from 159.5 to 173.5 cm., 4,000 c.c.; from 173.5 to 182.5 cm., 4,800 c.c.; 182.5 cm. and above, 5,100 c.c.. Females: Height from 154.5 to 162 cm., 2,825 c.c.; from 162 to 167 cm., 3,050 c.c.; 167 and above, 3,275 c.c.

group of cases, therefore, we have attempted to plot the variations in the vital capacity of the lungs and to compare with these the changes in the clinical condition. Each observation has consisted of a careful clinical examination of the patient, together with the recording of a statement as to whether the examiner considered the patient's general condition to be improved, worse or stationary, and then the determination of the vital capacity of the lungs. Instead of the recording spirometer which was used in the previous observations on the vital capacity of the lungs, in this series of cases we have used an ordinary well-balanced spirometer of 8 liter capacity. The subjects were told to take as deep an inspiration as possible, and then to insert the tube to the spirometer into the mouth and give a complete expiration. The volume of the expiration was measured on the spirometer wheel. In a few subjects who were very ill or were for other reasons unable to cooperate, and in a few who were unwilling to cooperate, satisfactory results could not be obtained, but in most instances it proved to be comparatively easy to get records that apparently represented with considerable accuracy the vital capacity of the lungs.

Judgment as to the clinical condition of our patients has been based on the degree of dyspnea, edema, pleural transudate, ascites, pulmonary congestion, acute enlargement of the liver, cyanosis, and pulse rate or pulse deficit. In two cases, of which special mention will be made, precordial pain and cutaneous or muscular hyperesthesia were considered as symptoms of myocardial weakness.

Twenty-four patients with some severe form of cardiac disease have been studied. In five patients in whom the objective evidences of myocardial insufficiency were marked, the alterations in clinical condition took place extremely slowly. For this reason it was frequently difficult or even impossible to note any changes in observations made at short intervals. It was under these circumstances that the greatest discrepancies between the vital capacity records and our

TABLE 2.—EFFECT OF EDEMA ON VITAL CAPACITY

Case	Date	Vital Capacity		Condition	Remarks
		C.c.	%		
6 Med. No. 6229 Mitral stenosis Auricular fibrillation	3/ 3	1,900	47	.....	Orthopnea; cyanosis; edema of legs
	3/ 4	1,800	45	Improved	Less edema of legs
	3/ 5	1,900	47	Improved	Less edema and has dyspnea
	3/ 7	2,200	56	Improved	Less dyspnea; less edema of legs
	3/ 9	2,500	62	Improved	Improved; breathing easier
	3/12	*2,400	60	Stationary	
	3/16	2,200	55	Stationary	
	3/19	2,400	60	Stationary	
	3/26	2,200	58	Stationary	Some edema of legs; out of bed, but becomes dyspneic on slight exertion

TABLE 3.—EFFECT OF HYDROTHORAX AND ASCITES ON VITAL CAPACITY

Case	Date	Vital Capacity		Condition	Remarks
		C.c.	%		
7 Med. No. 6284 Mitral stenosis Aortic regurgitation	3/15	2,250	44	.....	Orthopnea; ascites; large liver; edema of legs
	3/16	2,500	..	Stationary	
	3/19	2,700	53	Improved	Less edema of legs
	3/22	2,500	49	Stationary	
	3/26	2,500	49	Stationary	
	3/31	2,900	57	Improved	Lungs clear; ascites gone; no edema
	4/ 4	2,900	57	Stationary	
	4/ 6	2,900	57	Stationary	
	4/10	2,950	58	Stationary	
	4/14	3,100	61	Stationary	Left hospital in rather poor condition; can walk, but probably unable to do work
8 Med. No. 6114 Chronic myocarditis	2/12	1,510	31	.....	Orthopnea; edema of legs; hydrothorax; Cheyne-Stokes respiration
	2/13	1,575	33	Improved	Less dyspnea
	2/15	1,675	35	Improved	Edema gone from legs
	2/16	1,900	40	Improved	Much more comfortable
	2/19	1,800	37	Stationary	
	2/23	1,800	37	Improved	No rales in lungs; no edema of feet
	2/27	2,000	42	Improved	Cough gone
	3/ 1	2,100	45	Stationary	
	3/ 5	1,950	41	Stationary	Nocturnal dyspnea persists; in wheel chair, but condition very poor
9 Med. No. 6335 Chronic myocarditis	3/27	1,200	25	.....	Orthopnea; much ascites and edema
	3/31	1,700	35	Improved	Condition improved; no ascites
	4/ 4	2,300	48	Improved	Lies flat without discomfort
	4/ 6	2,000	42	Stationary	
	4/10	2,250	44	Stationary	
	4/14	2,300	48	Stationary	Left the hospital compensated; patient must lead a restricted life
10 Med. No. 6344 Chronic myocarditis	3/26	2,000	50	.....	Orthopnea; massive edema; much ascites
	3/31	2,100	53	Improved	Record of vital capacity is unsatisfactory; less ascites
	4/ 4	2,900	73	Improved	No edema of legs; ascites gone
	4/ 6	2,800	70	Improved	Moderate diuresis, no change in clinical condition
	4/10	3,000	75	Stationary	
	4/14	3,000	75	Stationary	Left the hospital

TABLE 3.—EFFECT OF HYDROTHORAX AND ASCITES ON VITAL CAPACITY—Continued

Case	Date	Vital Capacity		Condition	Remarks
		C.c.	%		
11 (Chart 1) Med. No. 6261 Chronic myocarditis Auricular fibrillation	3/ 9	1,400	42	.....	Acutely decompensated; hydrothorax; orthopnea; edema of legs
	3/10	1,475	45	Improved	Less dyspnea but still orthopneic
	3/12	1,860	55	Improved	Less edema; less dyspnea; less hydrothorax
	3/16	2,500	76	Improved	Lungs clear; less dyspnea; hydrothorax gone
	3/19	2,700	82	Stationary	
	3/22	2,775	85	Stationary	
	3/26	2,800	86	Stationary	Left hospital in good condition
12 (Chart 2) Med. No. 6152 Mitral stenosis Auricular fibrillation	2/16	1,150	29	.....	Orthopnea; cyanosis; anasarca
	2/17	1,200	30	Worse	Increased edema
	2/19	1,050	26	Stationary	Marked dyspnea; condition bad
	2/23	650	14	Worse	Died
13 Med. No. 6178 Chronic myocarditis Auricular fibrillation	2/20	1,400	29	.....	Orthopnea; marked ascites; anasarca
	2/21	2,300	48	Improved	Much less dyspnea; edema unchanged
	2/22	.....	..	.....	Abdominal paracentesis
	2/23	2,700	52	Improved	Less dyspnea; still in bed
14 Med. No. 6541 Chronic myocarditis	5/ 5	1,500	38	.....	Orthopnea; moderate ascites; moderate edema of legs
	5/ 7	2,150	54	Improved	Less dyspnea; no edema and no ascites
	5/ 9	3,500	88	Improved	No dyspnea
	5/16	3,600	90	Stationary	Out of bed and in good condition

judgment of the progress of the case have occurred. Nevertheless these discrepancies have never been great, and the subsequent course of the case has invariably shown an error in judgment rather than an error in the indications of the vital capacity records. A comparison of our clinical observations as to the progress of the case with the vital capacity findings is given in Table 1.

Diminution in edema of the extremities resulting from rest in bed does not necessarily represent improvement in the functional condition of the myocardium. It may be explained as a static phenomenon resulting from a change from the vertical position assumed in sitting or standing to the horizontal position in bed. On the other hand, edema, while apparently leaving the body, may merely be redistributed, as is sometimes shown by the failure of the patient to lose weight (Table 2).

Two frequent complications of cardiac disease which modify the vital capacity are hydrothorax and ascites. It is to be expected that the vital capacity would increase corresponding to the diminution of the amount of fluid in the pleural or peritoneal cavities. The findings in the patients we have studied in whom either hydrothorax or ascites, alone or combined, were present are given in Table 3.

In six of the eight cases outlined in Table 3 the hydrothorax and ascites disappeared while the patients were under observation. After the disappearance of the pleural and peritoneal fluid, the vital capacity continued to increase to the extent of from 4 to 6 per cent. in three cases, and 10, 12 and 36 per cent. in the other three. The findings indicate that the decrease in the vital capacity in these cases depended in part on the factors other than the hydrothorax and ascites.

Mackenzie has long believed that anginoid pain or cutaneous and muscular hyperesthesia were evidence of myocardial insufficiency. It is interesting to note that with the onset of such symptoms in two otherwise uncomplicated cases of mitral stenosis, the vital capacity dropped markedly, to rise again with the cessation of symptoms. In one of these cases there

TABLE 4.—EFFECT OF ANGINOID PAIN OR CUTANEOUS AND MUSCULAR HYPERESTHESIA ON VITAL CAPACITY

Case	Date	Vital Capacity		Condition	Remarks
		C.c.	%		
15 Med. No. 6176 Mitral stenosis	2/21	2,450	80	.....	Cyanosis; frequent cough; slight edema; no dyspnea
	3/ 1	2,950	97	Improved	No edema; less cough
	3/ 5	2,200	73	Worse	Precordial pain
	3/ 9	2,700	89	Improved	No pain; left hospital in good condition
16 Med. No. 6480 Mitral stenosis	4/20	2,000	61	.....	Dyspnea on exertion; comfortable in bed
	4/27	1,900	60	Stationary	
	4/30	2,400	73	Improved	Subjective improvement
	5/ 2	2,600	80	Stationary	
	5/ 9	2,000	61	Worse	Cutaneous and muscular hyperesthesia
	5/10	2,100	64	.....	Hyperesthesia unchanged
	5/14	2,965	91	Improved	Hyperesthesia gone
	5/15	3,000	91	Stationary	
	5/18	3,000	91	Stationary	
	5/25	3,100	94	Stationary	Condition good; walking about the ward
17 Med. No. 6262 Mitral stenosis Aortic insufficiency	3/ 9	1,100	39	.....	Orthopnea on slight exertion; moderate edema of legs
	3/10	1,200	42	Improved	Less edema
	3/12	1,375	48	Improved	
	3/16	1,650	58	Stationary	Vital capacity is increased, but no change noted in clinical condition; still in bed
	3/19	1,500	53	Stationary	
	3/22	1,850	65	Improved	Less cyanosis; less dyspnea; no edema
	3/26	1,900	66	Stationary	Gets dyspneic on moderate exertion
18 Med. No. 6293 Chronic myocarditis	4/ 7	1,900	48	.....	Acutely decompensated tender, pulsating liver; no dyspnea while in bed
	4/10	2,400	60	Improved	Liver not palpable
19 (Chart 3) Med. No. 6130 Chronic myocarditis Auricular fibrillation	2/13	1,700	42	.....	Marked dyspnea; orthopnea; much edema of legs
	2/14	2,175	54	Improved	Less dyspnea; less edema
	2/16	2,800	70	Improved	Less edema; less dyspnea
	2/19	3,200	80	Improved	Less edema; less dyspnea
	2/23	3,150	79	Stationary	
	2/27	2,550	88	Stationary	Less cough
	3/ 1	3,550	88	Improved	
	3/ 5	3,200	80	Stationary	
	3/ 8	3,450	86	Stationary	
	3/12	3,575	89	Stationary	General condition good; walking about the ward

TABLE 4.—EFFECT OF ANGINOID PAIN OR CUTANEOUS AND MUSCULAR HYPERESTHESIA ON VITAL CAPACITY—Continued

Case	Date	Vital Capacity		Condition	Remarks
		C.c.	%		
20 Med. No. 6135 Mitral stenosis	2/14	1,200	42	.....	Much dyspnea even when at rest
	2/15	1,275	45	Improved	Less dyspnea
	2/17	1,400	49	Improved	Slight edema
	2/18	1,200	42	Worse	More dyspnea
	2/24	1,400	49	Improved	Less dyspnea; comfortable in bed
	2/27	1,475	52	Stationary	
	3/ 1	1,400	49	Stationary	
	3/ 4	1,650	58	Stationary	
	3/ 5	1,575	55	Stationary	Up in chair; dyspnea on slight exertion
21 Med. No. 6491 Mitral stenosis	4/25	1,900	68	.....	Dyspnea on exertion, but comfortable in bed
	4/26	1,800	64	Stationary	
	4/27	1,950	69	Stationary	
	4/30	1,950	69	Stationary	
	5/ 2	2,000	71	Stationary	
	5/ 9	2,100	74	Stationary	
	5/15	2,200	77	Improved	Less dyspnea on exertion
	5/18	2,200	77	Stationary	Out of bed; no dyspnea while walking about ward
22 Med. No. 6241 Chronic myocarditis Auricular fibrillation	3/ 4	3,100	78	.....	Dyspnea; cyanosis
	3/ 5	3,500	88	Improved	Much better; less dyspnea
	3/ 8	3,500	88	Stationary	
	3/12	3,475	87	Stationary	
	3/16	3,600	90	Stationary	
	3/19	3,500	88	Stationary	
	3/22	3,500	88	Stationary	No dyspnea when walking
23 Med. No. 6273 Chronic myocarditis	3/13	2,475	51	.....	Slight edema of shins; dyspnea; cough
	3/14	2,400	50	Stationary	
	3/16	2,300	48	Stationary	
	3/19	2,500	52	Improved	No edema of shins; much cough
	3/22	2,300	48	Stationary	Less cough
	3/26	2,600	54	Stationary	Much cough; râles in both lungs; no noticeable change in condition since entering hospital
24 Med. No. 6399 Mitral stenosis	4/ 7	2,500	63	.....	Slight dyspnea at rest; bloody sputum
	4/10	3,100	78	Improved	No dyspnea at rest; no sputum
	4/17	3,400	85	Stationary	
	4/20	3,200	80	Stationary	
	4/23	3,500	88	Stationary	Out of bed
	4/27	3,400	85	Stationary	Condition unchanged
	5/ 5	3,200	80	Stationary	
	5/ 7	2,800	70	Worse	Increased dyspnea
	5/ 9	3,000	75	Stationary	
	5/15	3,100	78	Stationary	
	5/17	3,400	85	Improved, stationary	
	5/23	3,400	85	Stationary	Left hospital in good condition

was a rather sharp anginoid pain over the precordium. In the other case there was marked cutaneous hyperesthesia over the front of the left chest, over the pectoral muscles, and also over the trapezius muscle in the neck. Deep inspiration did not cause pain in either case. The vital capacity findings are given in Table 4.

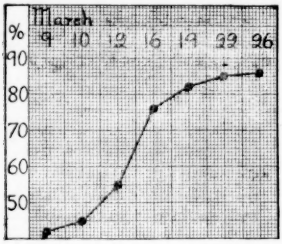

Chart 1—Vital capacity in Case 11.

The vital capacity in a patient with paroxysmal tachycardia was studied during and after an attack. There were no evidences of organic heart disease, and during the paroxysm there were no symptoms referable to the heart. Sixteen hours after the onset of a paroxysm in which the heart rate was 180 per minute, the vital capacity was 58 per cent. Two days late, and twenty-four hours after cessation of the tachycardia, the vital capacity had increased to 83 per cent. A continued rapid rate of the heart in paroxysmal tachycardia is frequently accompanied by marked signs of myocardial insufficiency, but in our case the lowered vital capacity was the only indication of this. The accompanying charts show graphically the changes in the vital capacity in three typical cases (11, 12 and 19). Such charts are excellent objective records of the clinical course which each of the patients has passed through.

REPORT OF THREE TYPICAL CASES

CASE 11 (Med. No. 6261).—*Chronic myocarditis, auricular fibrillation, hyperthyroidism.*—Woman, aged 39, white, admitted, March 9, 1917, discharged, March 30, 1917, had had exophthalmic goiter for the last eight years. Six years ago she had a break in cardiac compensation, since which time her feet had been edematous at different periods. On entrance to the Peter Bent Brigham Hospital there were orthopnea, double hydrothorax and considerable edema of the legs. The usual findings of exophthalmic goiter were present. The area of cardiac dulness measured 19 cm. to the left in the fifth interspace and 2 cm. to the right in the fourth interspace. The cardiac action was absolutely irregular. A systolic murmer was audible over the region of the apex of the heart. Blood pressure was 142 mm. systolic and 90 mm. diastolic. The electrocardiographic diagnosis was auricular fibrillation.

Chart 2.—Vital Capacity in Case 12.

March 10, there was less edema of the legs than was present on admission.

March 12, the edema of the legs had subsided. There was less fluid in the pleural cavities.

March 16, hydrothorax was no longer present.

March 19, 22 and 26, the vital capacity had increased 10 per cent. since March 16. During that time the patient's physical condition had much improved. The pulse rate had diminished from 80 to 90 to from 60 to 70 per minute, and the heart was well compensated.

CASE 12 (Med. No. 6152).—*Mitral stenosis and insufficiency, myocardial insufficiency, auricular fibrillation, bronchitis, syphilis.*—Man, aged 53, white, admitted, Feb. 15, 1917, died, Feb. 24, 1917, had been told ten years before that he had a valvular heart disease. During the last four years the patient had had occasionally a little dull precordial pain, and also some dyspnea on unusual exertion, and momentary attacks of vertigo. For several years his memory had been faulty, and he had become definitely irritable in disposition. The present illness began three months before with the symptoms of acute bronchitis and dyspnea, which had grown progressively worse. For the last week before admission to the Peter Bent Brigham Hospital the legs had been swollen. Physical examination showed marked orthopnea, anasarca, and deep cyanosis of the face, lips, ears and fingers. The area of cardiac dulness measured 14 cm. to the left in the fifth interspace and 45 cm. to the right in the fourth interspace. The heart's action was absolutely irregular, and there was a pulse deficit of 38 to the minute. There was a systolic murmur audible over the entire precordium, loudest in the region of the apex of the heart. In the longer pauses between heart beats a short early diastolic murmur was heard at the apex. Blood pressure was 130 mm. systolic and 90 mm. diastolic.

February 17, the patient was slightly worse. There was an increase in the edema of the scrotum, and the patient's cough was more frequent. However, there was less cyanosis than on admission.

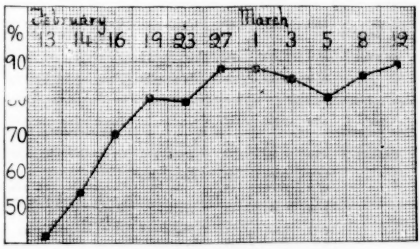

Chart 3—Vital capacity in Case 19.

February 19, the patient's condition was unchanged.

February 23, the patient was decidedly worse. He appeared to be much weaker physically. The cough was more frequent. He died several hours after the last vital capacity record had been obtained.

CASE 19 (Med. No. 6130).—*Chronic myocarditis, hypertension, auricular fibrillation, chronic nephritis.*—Man, aged 63, white, admitted, Feb. 12, 1917, discharged, March 13, 1917, had unimportant past medical history. The present illness began ten weeks before admission to the hospital with some generalized weakness, slight dyspnea, and fatigue on exertion. For the last three weeks the patient has been dyspneic. Physical examination revealed that the patient was orthopneic. There was considerable edema of the legs. There were coarse râles throughout both lungs. The area of cardiac dulness measured 16 cm. to the right in the fourth interspace. The heart's action was irregular, and the cardiac sounds were but faintly audible. No murmurs were heard. The aortic second sound was accentuated. Blood pressure was 190 mm. systolic and 90 mm. diastolic. An electrocardiogram showed the condition of auricular fibrillation to be present.

February 13, the patient was orthopneic. There was considerable edema of the feet and legs. Numerous coarse moist râles were present throughout both lungs. There was some cough.

February 14, there was much less edema of the feet and legs. Cough persisted.

February 16, the edema of the feet and legs had almost dis-

appeared. But few râles were present in the lungs. Cough persisted.

February 19, the patient lay comfortably in the prone position. The cough persisted.

No change occurred in the patient's condition until March 1. The cough was much less and there was little sputum.

March 3, 5, 8 and 12, the patient's condition remained stationary.

March 13, the patient was discharged from the hospital able to return to his work as a cabinet maker.

SUMMARY

Attention is called to the importance of a decrease in the vital capacity of the lungs as a factor in the production of dyspnea in heart disease. The degree to which the vital capacity is decreased below certain normal standards corresponds closely to the tendency to dyspnea. Since the tendency to dyspnea depends largely on the functional capacity of the heart, the determination of the vital capacity of the lungs may serve as an indirect measure of the cardiac condition. In a series of twenty-four cases it has been found that the clinical condition of cardiac patients varies closely with the changes in the vital capacity of the lungs. An improvement in the functional state of the heart is associated with a rise in the vital capacity. When the condition of the heart is apparently remaining stationary, changes in the vital capacity are not marked, and when there is evidence of increasing cardiac insufficiency, the vital capacity of the lungs falls. Charts showing the variations in the vital capacity of the lungs of patients with heart disease are frequently satisfactory objective records of the clinical course of the disease, and they may be of distinct aid in prognosis.

ABSTRACT OF DISCUSSION

DR. JOSEPH H. PRATT, Boston: Stimulated by Dr. Peabody's work, Dr. Paul D. White and I began a study of the vital capacity in patients at the cardiac clinic at the Massachusetts General Hospital. We have the records now of fifty patients. We find that the vital capacity corresponds closely to the functional condition of the heart as determined by the ordinary methods. Patients who were short of breath after walking slowly on a level for a distance of one or two blocks had usually a vital capacity of 50 per cent. or less. Ambulatory patients rarely have less than 40 per cent. In one case, however, it was 30 per cent. In diagnosis, the test is of great value in distinguishing between true cardiac weakness and those cases of cardiac neurosis that simulate organic disease of the heart. The difficulty in distinguishing between these two conditions is due to the fact that the first symptoms of cardiac weakness are usually subjective. The patient first notices slight breathlessness on exertion, and this may be present in organic heart disease before anything abnormal is found in the physical examination.

The value of the test was shown strikingly in the following case: A man had been treated in the dispensary for a year for myocardial disease. He complained that he was short of breath when he walked on the level a distance of 100 yards. Although nothing abnormal was found on the examination of the heart, the diagnosis had never been disputed. We found that his vital capacity was normal. From careful inquiry I learned that although he claimed to have a feeling of breathlessness while walking, he was able to run up stairs without any discomfort. This showed conclusively that the subjective sensation of which he complained was not due to cardiac weakness. We had mistaken a cardiac neurosis for organic heart disease.

The method is of improtance in determining the functional capacity of the heart in patients who are in bed. Recently I had under observation at one time three patients with mitral stenosis. All gave a history of shortness of breath on slight exertion. In bed they exhibited no signs of cardiac insufficiency. They were able to lie with their heads low; there was no edema, and the pulse in each case was slow. To have tested their cardiac capacity by allowing them to exercise would have been too hazardous. The vital capacity test was made. Two had 40 per cent., the other about 80 per cent. I had previously suspected that there was a large neurotic element in the patient with the high vital capacity. Encouraged by the result of this test she has been taking recently, without discomfort, more exercise than she had for several years. The results of treatment among our ambulatory patients has not been encouraging as measured by the vital capacity test, and in only one case has there been a marked increase in the vital capacity from the use of digitalis, with the patient up and about. In this case, which was one of auricular fibrillation, the increase amounted to 25 per cent.

DR. T. B. BARRINGER, JR., New York: I am able in many ways to confirm the results which Dr. McClure has obtained. In estimating the vital capacity in cardiac patients I have found that it is much lower than in normal persons, and the greater the insufficiency, the lower the vital capacity. In cardiac patients with normal reserve power I have found that the vital capacity is normal. In cardiacs with low reserve power, but no insufficiency, the vital capacity is frequently normal. I have felt that the decrease in vital capacity in cardiac insufficiency was due to the congestion of the lungs which was present. In the treatment of patients by graduated exercises I have found that as the heart's reserve power increases and the clinical condition of the patient improves, the vital capacity goes up. Two years ago I drew attention to a small series of cases in which the average increase of vital capacity during the course of treatment was 25 per cent.

DR. R. G. PEARCE, Cleveland: I have an interesting case which Dr. Hoover and I saw in Lakeside Hospital, in which we estimated the vital capacity of the lungs and the cardiac output by the method proposed by Christianson, Douglas and Haldane, which determines the blood flow through the lungs per minute; that is, cardiac output of the right ventricle. The man had a badly decompensated heart. He had a vital capacity of about 1.2 liters and a cardiac output of 3 liters. After a course of digitalis for three days he had a vital capacity of 1.8 liters and a blood flow per minute of 4 liters. After a week he had 2.4 liters vital capacity and a blood flow of 4.5 liters per minute. The normal man has a cardiac output of 5 or 6 liters per minute. I think this observation is interesting because it checks up cardiac output with vital capacity.

DR. C. W. MCCLURE, Boston: A study has been made of cardiac patients who were compensated, and it has been found, as I tried to bring out early in the paper, that the vital capacity in patients with cardiac disease who we say are compensated varies in different patients. If the patient can lead a normal life, the vital capacity is almost invariably above 90 per cent. If the patient is able to do a slight amount of work, but must lead a restricted life, the vital capacity will fall almost invariably to somewhere between 70 per cent. and 90 per cent. of the normal. Patients whose vital capacity is less than 70 per cent. are dyspneic on very moderate exertion. The lower the vital capacity, the easier the patient becomes dyspneic, and patients who are down near 40 per cent. are usually decompensated or become decompensated very easily.

A New Method of Cleaning Slides.—The method of cleaning old used slides given below is new so far as the writer knows, and as it is simple, cheap and effective, it seems to merit publication. The only reagent necessary is commercial (household) ammonia used full strength. The slides are soaked in this indefinitely (at least twenty-four hours), when it will be found that they can be rinsed in water and wiped clean. Stained smears of all kinds covered with immersion oil and tissue sections mounted in balsam are all equally well cleaned. The immersion oil need not be removed before soaking, although it is advisable to wipe off the excess. The ammonia may be used repeatedly if kept in a receptacle with a tight cover to prevent loss.—REUBEN A. JOHNSON, M.D., Minneapolis.

SALVARSAN AND NEOSALVARSAN MYELITIS

REPORT OF A FATAL CASE

G. W. McCASKEY, M.D.
FORT WAYNE, IND.

It is not surprising that, when so fatal a disease as syphilis of the central nervous system is attacked with a drug so powerful as arsenic, serious results should now and then occur. The gravity of the disease and its general tendency toward fatality, however, fully justify the risk in view of the beneficial results so commonly observed. Only a few cases of myelitis have been so far recorded, although it is probable that a considerable number of unrecognized cases have occurred or been reported under more general captions. Perhaps the most common neurotoxicologic result of the administration of salvarsan has been a hemorrhagic encephalitis. In some cases this has been verified by necropsy and histologic examination. In some of the cases, however, which clinically looked like encephalitis nothing was found histologically in the central nervous system.

The following reports are brief outlines of the few cases recorded, together with the description of my own case.

Bayet[1] reported the following case:

CASE 1.—A man, aged 24, came under treatment for secondary syphilis, three months after the primary lesion. At that time he was given 0.7 gm. of neosalvarsan intravenously. This was well tolerated, although there was a slight general malaise. Ten days later, August 26, he received 0.8 gm., and immediately thereafter developed fever, with a scarlatiniform eruption. There was vomiting for two days. September 1 he was suddenly found paraplegic. There was bladder paralysis with loss of the superficial and deep reflexes, with the single exception of the plantar reflex. There was no Babinski reflex. The spinal fluid was not under increased tension, contained no lymphocytes, and gave a negative Wassermann reaction. This case was not fatal so far as known, but the subsequent history was not followed up.

Socin[2] reported the following case:

CASE 2.—A woman, aged 38, suffering from syphilis, but without any involvement of the central nervous system, was given 0.5 gm. of salvarsan, intravenously. No symptoms followed this treatment. Five days later the same dose was repeated. No symptoms were manifested for forty-eight hours, at the end of which time she began to have a slight elevation of temperature and, later in the day, general convulsions followed by vomiting and complete apathy. There was a leukocytosis of 10,000 with 86 per cent. polymorphonuclears. About a month later an extensive decubitus developed. Motor and sensory paralysis of irregular distribution was present. This patient for a little more than a year had all the symptoms of a severe myelitis, and died of an intercurrent pneumonia.

The following case of myelitis, apparently caused by the intravenous injection of neosalvarsan, was reported by Chiari[3]:

CASE 3.—Three months after acquiring a genital chancre, a woman, aged 27, appeared at the clinic with symptoms of secondary syphilis. This was June 1, 1912. That day she received 0.7 gm. of neosalvarsan intravenously. June 4 she was given 1.2 gm., and June 7, 1.4 gm. Immediately following the last injection there appeared a scarlatiniform exanthem that lasted nine days. About the same time that the eruption disappeared, vomiting began, lasting a week. June 13, she began to show symptoms of paralysis of the lower extremities, which soon became complete. June 19, a large decubital ulcer developed over the sacrum and later became quite extensive. During this time she developed albumin and casts and blood in the urine. The further history of the case was that of a severe progressive myelitis, of which she died, December 15, six months after beginning the treatment. This patient also had a terminal pneumonia. The anatomic findings were those of an inflammatory process, especially involving the gray matter of the cord, but to a lesser extent the white substance as well.

My own case of myelitis, which, as far as I can determine, is the fourth case reported under that title, presents the following history:

CASE 4.—Miss R., aged 40, first consulted me, Dec. 15, 1915. She presented the typical syndrome of tabes dorsalis: the tabetic gait, lightning pains, loss of the knee jerk, and the Argyll Robertson pupil. The blood Wassermann test was negative. The routine blood examination revealed: hemoglobin, 85 per cent; leukocytes, 12,600; polymorphonuclears, 72 per cent.; small lymphocytes, 22; large lymphocytes, 2; transitionals, 4. The spinal fluid was not under very great pressure, but contained excessive globulin, with 16 lymphocytes per cubic centimeter with a + + + Wassermann reaction. The colloidal gold test showed 0000440005. At a later date the gold test was 2120000000. There was no heart involvement, but a mild grade of interstitial nephritis. The urine had a specific gravity of 1.010, with 44 per cent. phenolsulphonephthalein output in two hours and ten minutes. There was neither albumin, nor sugar, nor casts. The digestive functions were normal. There had been a little diplopia at times, but the eyegrounds were normal on ophthalmoscopic examination.

The patient was placed on the Swift-Ellis treatment at intervals of about two weeks, diarsenol being used intravenously and the blood being taken in about twenty minutes, the serum being given intraspinally on the following morning. The patient improved satisfactorily, and, after a couple of months' time, neosalvarsan, being procurable, was used instead of the diarsenol.

Early in May, after five months of Swift-Ellis therapy, the treatment was changed to the simultaneous combined intravenous and intraspinal injection. After the usual dose of neosalvarsan intravenously (about 0.6 to 0.8 gm.), an intraspinal injection was immediately given with the following technic:

A solution of neosalvarsan is made so that each cubic centimeter contains 100 mg. With a finely graduated pipet 0.05 c.c. is measured into a sterile glass representing 5 mg. This is taken up into a Lüer syringe with 5 c.c. of physiologic sodium chlorid solution. Each cubic centimeter represents 1 mg., and it is very easy to retain in the syringe the exact dose desired.

After the preparation of this dilution the lumbar puncture needle was introduced and as much spinal fluid was removed as was desired for laboratory purposes. The syringe was then directly connected with the lumbar puncture needle in situ, and the spinal fluid allowed to run directly into the syringe, diluting the 1 mg. more or less of neosalvarsan up to 5 or 6 c.c., according to circumstances. The contents of the syringe were then immediately reinjected into the spinal canal. This technic of intraspinal injections is still being used, but the dose does not exceed 1 mg., beginning with about 0.5 mg., and is usually not given on the same date as the intravenous injection, to avoid confusion of reactions.

The patient had been given about four of these treatments at intervals of ten days, the dose of neosalvarsan intraspinally being gradually increased up to 1.8 mg. June 16, the same sized dose was given without any marked reaction, although the symptoms were somewhat more severe than usual. Eight days later, precisely the same treatment was repeated. The reaction immediately following the treatment was not unusually severe. The leg and back pains were perhaps slightly more severe than they had been following

1. Bayet: Jour. méd. de Bruxelles, 1912, **17**, 395.
2. Socin: Cor.-Bl. f. schweiz. Aerzte, Nov. 18, 1916.
3. Chiari: Abstr., Verhandl. d. deutsch. path. Gesellsch., 1913.

previous treatments. On the next day she complained that she could not see well, that the legs were weak, and she was unable to void urine. The slight motor and sensory impairment present in the lower extremities gradually increased to complete paralysis. In the course of from four to five days, signs of a decubital ulcer were found over the sacrum, and this gradually became worse. The patient was taken home from the hospital in about a week's time, after which the symptoms remained about the same. A letter from her physician, dated September 18, stated that she had died from exhaustion, the only additional feature of interest being the enormous extent of the trophic ulcers. There were apparently a number of them over the extremities, and one very large one about 6 inches in diameter and circular in form over the sacrum, which the physician said extended down to and actually laid bare the vertebrae. No necropsy could be obtained.

CASE 5.—In addition to these cases of salvarsan and neosalvarsan myelitis reported under that title, I have been able to find another undoubted case reported by Wile[4] in discussing the technic of subdural injections. In this case, which was one of ordinary tabes in a man, aged 44, 1 mg. of neosalvarsan was given subdurally, Sept. 24, 1913, the injection being followed for five days by lightning pains and girdle pain. Two weeks later, 2 mg. were given subdurally, and this was followed by lightning pains not so severe as after the first treatment. Ten days later 2 mg. were again given in the same manner. One-half hour after this treatment there appeared extreme pain in the legs followed by urinary retention and paraplegia, and later by decubitus, without doubt the typical picture of acute myelitis. These symptoms grew progressively worse and the patient died, Dec. 5, 1913, about two and one-half months following the treatment. No intravenous injection was given in conjunction with these subdural injections. There seems to be no doubt that this fatal myelitis was due to the subdural injection of 2 mg. of neosalvarsan.

COMMENT

Ravout gave sixty-three subdural treatments of from 4 to 12 mg. of salvarsan in isotonic sodium chlorid solution without ill effect. Wechselmann gave from 0.5 to 3 mg. Wile also gave 3 mg., and I think sometimes considerably more without ill effect.

It is interesting to note that in these five cases of myelitis, with the exception of Wile's case and my own, the medication was intravenous alone. In Wile's case it was intraspinal alone, and in my own case it was intravenous and intraspinal. These cases seem to prove that the myelitis may result alike from the intravenous and the intraspinal medication, and in my own case leaves the question fairly open as to whether the myelitis was the result of one or the other or both.

Socin's case resulted from two doses of salvarsan intravenously, each one containing 0.5 gm., while Chiari's case followed three doses of neosalvarsan of 0.7, 1.2 and 1.4 gm., respectively. Bayet's case followed two doses of 0.7 and 0.8 gm. of neosalvarsan intravenously, eleven days apart, while in my own case at least half a dozen 0.8 gm. doses of neosalvarsan intravenously and from 0.5 to 1.8 mg. intraspinally preceded by several doses of diarsenol with a slightly modified Swift-Ellis technic, had been given.

In Chiari's opinion, these severe degenerative and even destructive effects of salvarsan and neosalvarsan on the central nervous system are due to some abnormal condition of their arsenical content. Obermüller[5] had already collected five instances of arsenical poisoning in which certain definite cord changes had been found. These consisted for the most part of degeneration of the anterior cornua, and of certain fibers in the anterior segments of the cord. There were also occasional hemorrhages into the cord. In Chiari's case of salvarsan myelitis, the histologic changes found in the cord bore a very close resemblance to those described in some of the cases collected by Obermüller; and Chiari, therefore, concludes that in his case of myelitis it was the result of the arsenical content of the salvarsan.

This conclusion may seem too obvious to require confirmation, but such is really not the case. As a matter of fact, we are dealing with very complex molecules of the atoxyl series, which undoubtedly undergo fundamental changes within the blood and tissues, giving rise to many intermediate bodies. These chemical reactions and interactions, quite possibly, if not probably, vary widely in different cases. It is known that some of these compounds are intensely toxic, and the conclusion that the myelitis is the direct result of the arsenic finally separated, for example, from the salvarsan molecule in the course of the retrograde chemical changes, instead of some of these intermediate bodies, has something more than a theoretical interest. It can be fairly assumed that many of the unpleasant and serious reactions following the administration of neosalvarsan are due to some of the intermediate bodies above referred to, of the exact nature of which we are for the most part ignorant. In the course of my own clinical observation, I have seen a considerable number of reactions, such as scarlatiniform eruptions, anuresis, chills and fever, intense headache, back and limb pains, and circulatory and digestive disturbances, which, to say the least, were unpleasant and sometimes positively alarming. Reactions of somewhat milder type are certainly very common after the intravenous method. Whether these milder reactions differ only in degree from the severer ones is difficult to determine. It would seem probable that slight neurotropic, or other transient structural alterations, might occur in various organs, from which recovery might rapidly ensue. It would seem that we are constantly confronted with the remote possibility of a catastrophe, such as a hemorrhagic encephalitis or a myelitis. In view, however, of the enormous number of intravenous injections that have been given, running up as they do into many millions, the probability of such accidents must be exceedingly remote.

Wechselmann[6] is of the opinion that they cannot be explained on purely toxicologic grounds. Clinical observation does, indeed, seem to indicate that the drug alone cannot be wholly responsible for the results. The observation of Querst, for instance, in which eight patients received injections from the same solution, one after the other, the fourth one being fatal, not only proves this but also proves that the fatality was not due to oxidation products caused by standing too long, because the four patients later injected from the same solution remained well.

It does seem, indeed, that there must be something in the chemistry of the patient's body fluids which in some way by its action on salvarsan produces toxic bodies, and it would seem most probable that it is due to some of the abnormally toxic intermediate bodies above referred to. It is, of course, necessary to assume fundamental differences in the chemical bodies found in the organism on one day from those found on

4. Wile, Udo: Technic of the Intradural Injections of Neosalvarsan in Syphilis of the Nervous System, THE JOURNAL A. M. A., July 11, 1914, p. 137.

5. Obermüller: Ueber Arsenlähmungen: Ein Beitrag zur Beurteilung der Nebenwirkungen des Salvarsan, Berl. klin. Wchnschr., 1913 **50**, 966.

6. Wechselmann: Salvarsan Fatalities, 1913, p. 8.

another. Such an assumption, however, is plausible enough in the light of well known facts along this line.

As Wechselmann points out, the fact that it is not usually the first dose that causes the damage militates strongly against the theory of a primary hypersensitiveness. It seems to me, however, that there still remains the possibility of a sensitization by the first dose somewhat along the lines suggested by this term in a strictly biologic sense, or possibly a very slight initial damage, which makes the tissues more vulnerable to subsequent doses.

Welchselmann's statement that insufficiency of the kidney is the point of the entire question of salvarsan fatalities has in it a ring of finality; but, in spite of his absolute preeminence as an authority on this question, this appears to me to be dogmatic. In his own case of salvarsan fatality, for instance, the patient received only 0.2 gm. It is difficult to believe that the moderate grade of renal insufficiency (which alone would be likely to be overlooked in salvarsan therapy) could cause a larger accumulation of the drug within the nerve centers than would probably occur with perfectly normal kidneys after the administration of doses at least seven or eight times as large, which have been repeatedly given without injury. It is not my intention to pursue the general discussion of the question of salvarsan fatalitities further than to consider its bearings on the question of myelitis. It is interesting to note that in encephalitis hemorrhagica produced by salvarsan, the blood vessels alone seem to be damaged, while the neurons remain intact, this point being confirmed by the careful study of the brain cells by Nissl.

CONCLUSIONS

1. Severe and even fatal myelitis may, though rarely, result from even small doses of salvarsan or neosalvarsan given either intravenously or subdurally.

2. This accident may happen without warning in cases in which the same treatment with identical doses had been well tolerated before.

3. It is not always, if at all, due to faulty manufacture, as the same solution has proved fatal to one and innocuous to others given within the same hour both before and after the fatal dose.

4. Wechselmann's conclusion that renal block furnishes the explanation of salvarsan fatalities seems entirely untenable.

5. The most plausible hypothesis seems to me to be the action of toxic compounds in the form of intermediary bodies with especial affinity for the neurons formed in the retrograde changes which occur in the salvarsan compounds and which may vary in different individuals and in the same individual at different times, and of the exact nature of which we are entirely ignorant.

6. Considering the enormous number of these treatments given, the occurrence of myelitis is so rare that it should be ignored as a negligible possibility.

409 West Main Street.

Autocracy and Democracy.—Autocracy finds its strength in its ability to impose organization by force from the top. The essence of democracy consists in the application of the initiative in its own people. If individualism cannot be so organized as to defend itself, then democracy is a faith which cannot stand. We are seeking to impose no organization from the top. We are asking the American people to organize from the bottom up, and this is the essence of democracy itself.—*Weekly Bulletin.*

EDEMA AS A DANGER SIGNAL IN THE STARVATION TREATMENT OF DIABETES

ALFRED C. CROFTAN, M.D.
CHICAGO

Since the popularization of the starvation method in newspapers and magazines, diabetics who had been carried along comfortably and safely for years have been clamoring for starvation. When their regular physician would not adopt the treatment, pilgrimages were undertaken to institutions that featured this cure.

My personal experience teaches me that in mild cases and cases of medium severity this rigorous plan is quite superfluous, and in certain types of the disease more dangerous than the old established methods. There is this advantage in the method, that the period of protein starvation that inaugurates every tolerance determination is materially shortened. This is not new, or altogether safe; it is advantageous chiefly from the economic standpoint by reducing the length of the hospital period.

As to tolerance, I have never so far seen an increase of the tolerance for carbohydrates in these milder cases follow a starvation cure; in fact, as a rule, I have found the tolerance reduced.

Alarming degrees of excretion of acetone bodies are apt to supervene in this type during starvation, or to follow the resumption of carbohydrate feeding. True, under the management of an expert and in properly equipped hospitals, these symptoms can as a rule be controlled; but, uncontrolled, in cases handled by routine outside, they are liable to become dangerous.

In very severe cases of acute onset, and in fulminating diabetes in children and adolescents, the method is of use as an emergency measure, the sugar often disappearing with startling rapidity, as rapidly as it generally disappears under a properly conducted oatmeal treatment. I regret to report that I have not, however, witnessed more favorable permanent results after starvation than after oatmeal, and the treatment is decidedly more uncomfortable, both to the patient and to the physician.

In view of the fact that starvation is generally employed outside of institutions and under the management of general practitioners who have neither the time nor the facilities, nor possibly the technical training, to control by daily chemical tests the effect of this strenuous method on the general metabolism of the patients, any clinical sign that is easy of recognition should be of value, especially if it constitutes a warning signal of impending danger from continuation of the routine.

Such a sign is edema occurring in the course of a starvation treatment, a sign that I have had occasion to observe frequently, that I have learned to regard with considerable trepidation, and that I do not find mentioned in the literature, the only reference to it that has come to my notice being a verbal acknowledgment of its occurrence by Woodyatt in the course of a discussion of starvation before the Chicago Society of Internal Medicine. Its occurrence in the course of oatmeal cures is mentioned by von Noorden.

Edema usually occurs suddenly, and is associated with an increase of excretion of the acetone bodies, a reduction in urination, and either a cessation of the weight reduction or even an increase in the weight, despite the withholding of food. On the administration of even small amounts of carbohydrate, the edema

rapidly disappears, and diuresis is promptly increased without, however, a degree of glycosuria corresponding to the increased urination.

In diabetics, generally, fed on carbohydrates up to or slightly below their tolerance, that is, in diabetics kept free from hyperglycemia and glycosuria, edema is very rare; in fact, diabetics suffering from complicating cardiac or renal lesions in which one would expect edema are generally conspicuously free from the latter.

In hunger, on the other hand, even in nondiabetic subjects, the urinary output generally is below normal in comparison to the liquid intake; hence starving patients not infrequently show no loss of weight for prolonged periods, and occasionally even gain weight. This, of course, can be due only to water retention, and is probably attributable to the retention of the water generated in starvation from the increased forced metabolism of the protein and fats, and from the liberation of water from the shrinking body tissues. No doubt the organism retains this water to maintain a degree of osmotic equilibrium compatible with cell life.

Edema, or its concomitant phenomenon, gain of weight, despite complete withdrawal of food and reduction of liquids, is a starvation phenomenon indicating forced catabolism of body tissues beyond the limits of safety; a degree of tissue destruction that constitutes the main element of danger in the severe types of diabetics, that rarely occurs spontaneously in the milder types of the disorder, and that a rational therapeutist should attempt by all means to prevent and to counteract.

"Pancreatic rest," postulated by Allen, is certainly not favored under these conditions; for nothing presumably can impose a greater strain on the hypothetic internal function of the pancreas than the disassimilation of products derived from forced tissue catabolism.

Edema occurring in starvation cures is a sign, therefore, to resume feeding; it is a danger signal that, if neglected, and especially if associated with nausea, severe headache and tremors, in my experience, invariably either leads to most alarming coma or, if this is prevented by large doses of sodium bicarbonate, leaves the patient, as far as his tolerance is concerned, in much worse condition than before the starvation plan was inaugurated.

Edema during "starvation" can be prevented by the administration of pancreatized oatmeal-alcohol-glycerin clysmata; I have found that they do not interfere with the rapid sugar reduction, that they prevent the enormous formation of acetone bodies and materially contribute to the comfort of the patient.

25 East Washington Street.

Lister and Vivisection.—Lister carried out his experiments at abattoirs and in his own home on various animals either after they were dead or when they were chloroformed, or, in the case of the frog, when it had been deprived of sensation by being "pithed." Sheep, horses, oxen, rabbits, cats, bats and frogs were the subjects of his experiments, but not in any great numbers as the somewhat formidable catalogue seems to show. Of the edible animals far more were killed during his lifetime for his consumption than by his experiments, and in the former case by men much less gentle in their feelings for animals than he. Without these experiments he would never have been led to his discoveries. Vivisection, he averred before the Royal Commission on vivisection which sat in 1876, had been essential to him.—Wrench, G. T.: Lord Lister, His Life and Work.

HAS THE NEW-BORN CHILD WITH SUTURED CORD A BETTER START IN LIFE?*

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AND
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This report is based on the study of 450 babies born at the City Hospital between March, 1916, and April, 1917. In half of these babies the cord was amputated by the suture ligature method of Dickinson; in the other half, the cord was ligated with two tape ligatures, one of which was placed near the skin margin of the umbilicus. No antiseptics were used in either case except a single application of alcohol to the skin margin in the amputated cases. Dry sterile gauze was placed over the umbilicus and left unchanged until the suture was removed or the cord came off, unless the dressing was accidently soiled. All the babies were cared for by the intern staff of the hospital, supervised in a general way by the senior physician in the obstetric division. The nursing care and records were in charge of Miss Pommel, who has been head nurse of the obstetric division for a number of years. We omitted from both series of cases all premature babies weighing less than 2,000 gm., all operative deliveries and all babies having a serious pathologic condition not associated with umbilical wound healing. In this way we dealt only with normal babies, and eliminated as nearly as possible all differences between the two series, except the manner of treating the umbilical cord. After we had tabulated the results in about 200 cases of each series, we found that additional cases made practically no change in the course of the weight curves, temperature percentages, etc., in the two series, as the mere multiplication of the same experiment could not materially have changed results.

The figure of eight suture[1] was placed 2 mm. within the skin margin of the umbilicus, sweeping around to avoid puncturing the vessels. A moderately fine silk was used for suture material and the suture, if not found clinging to the gauze on the third or fourth day, was cut and removed. In a few instances, through neglect, the suture was not taken out until the seventh or eighth day; there were, however, no apparent untoward symptoms. We have no doubt that the results with the suture method would have been somewhat improved if done only by the resident in charge of the obstetric department. This, however, was impracticable, and would have defeated the main purpose of this inquiry, which was to determine whether or not this method was sufficiently simple to be embodied as part of the hospital routine.

Our personal impressions of the Dickinson suture were favorable. Beyond an occasional slight temporary oozing from the skin stitch there were no complications. A single case of moderate bleeding after six hours occurred in a baby on whom the intern had taken the stitch at the margin of the skin instead of through the skin cuff itself. This was clearly due to faulty technic and not to the method itself. On the

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. For a detailed description of the suture ligature method of Dickinson, we would refer the reader to the Transactions of the American Gynecological Society of 1916.

other hand, with the ligation method we had moderate hemorrhage in two instances, requiring secondary ligation.

Since the majority of the mothers left the hospital from the eleventh to the fourteenth day and could not readily be followed up, we have but little to say regarding the effect of the suture method on the prevention of umbilical hernia. It is difficult to see how such hernias can be prevented unless the entire skin cuff is removed and the suture made to include the abdominal fascia. This must of necessity be a dangerous and unwarrantable procedure. The only case of umbilical hernia that occurred as far as we could ascertain among this series of 450 babies was in a child whose cord had been amputated by the Dickinson suture. The hernia occurred one month after birth, and was about the size of a twenty-five cent piece.

No deaths from infection of the umbilicus occurred in either group. In fact, under modern conditions in a well-regulated maternity institution, such a death rate can practically be eliminated by due asepsis, irrespective of the special technic employed in handling the cord. Minor infections, however, are still to be reckoned with, and we should not be satisfied until we have, as Adair puts it, "reduced them to an irreducible minimum." Adair's interesting bacteriologic studies of the umbilicus at birth are deserving of amplification and corroboration. According to him, the presence of pathogenic germs does not predispose to infection of the umbilicus. We think the question may fairly be raised whether the child at birth does not possess an inherited immunity against infection by

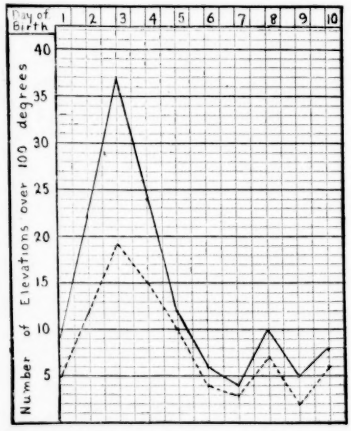

Chart 1.—Temperature elevations over 100 F.: solid line, sutured patients; broken line, ligated patients.

organisms whose habitat is the mother's vulva or vagina. The real danger of infection arises from the hands of the accoucheur or nurse and the instruments and dressings used in the care of the umbilicus. This might very well explain the apparent inconsistency in Adair's bacteriologic findings.

The most striking difference in our two series relates to temperature conditions. Of course we realize that there are other causes for a slight fever in the first ten days besides an umbilical infection, but these other causes should have been equally distributed in the two series, so that a marked difference between the two certainly has significance. We found that in the 225 sutured babies, eighty-five, or 37.7 per cent., developed at some time within the first ten days a temperature of 100 F. or more, whereas the ligated babies showed only fifty-one, or 22.7 per cent., with fever of 100 F. or more. The latter figures correspond exactly with Adair's results in 186 ligated cases with temperature elevations of 100+ F. in forty-two, or

TABLE 1.—TEMPERATURE CONDITIONS

Day	Sutured Patients		Ligated Patients	
	Over 99 F.	Over 100 F.	Over 99 F.	Over 100 F.
First.....	33	9	15	5
Second.....	56	22	38	12
Third.....	63	37	38	19
Fourth.....	50	24	42	15
Fifth.....	27	12	26	10
Sixth.....	27	6	11	4
Seventh.....	27	4	18	3
Eighth.....	30	10	30	7
Ninth.....	30	5	27	2
Tenth.....	41	8	29	6

22.58 per cent. When analyzed according to the days after birth we found the interesting comparison given in Table 1.

In both series the highest number of temperature elevations was recorded on the third and fourth days, and these were decidedly more frequent among the sutured patients. When, therefore, the suture method is applied by the average intern in the hospital, there is a somewhat greater likelihood of mild infections resulting therefrom than when simple ligation is employed. Doubtless this depends largely on the fact referred to by both Cullen and Dickinson that the cord has no capillaries, while the skin penetrated by the suture does possess such capillaries capable of absorbing infectious material. That these infections were not of serious consequence is seen by the fact that the average loss of body weight from the first to the tenth day in the eighty-five febrile sutured cases was 75 gm., whereas the average loss of the whole series of 225 was 68 gm.

As to disturbance of wound healing as evidenced by a watery odorous discharge, granulomas or prolonged attachment of the cord, we find distinct advantages in favor of the suture method. In twenty-seven instances of the suture method there was a slight tinge of bloody discharge from the umbilicus between the seventh and eleventh days, but never any odorous or free discharge. In the series of ligated babies, thirty-eight presented a bloody or moist discharge between the seventh and eleventh days. This discharge was much more pronounced than in the sutured babies. In five patients there was redness and odor as a result of umbilical necrosis and infection. Four developed granulomas that bled up to the thirteenth day. In forty instances the cord did not come off until between the tenth and thirteenth days. In one of these the baby left the hospital on the eleventh day with the cord still attached. The average length of time elapsing after birth until the separation of the cord was seven and seven-tenth days, which is about what Adair found in his series. Thus in about one third of the patients ligated we have an incompletely healed umbilicus at about the ninth or tenth day, at a time when in most boy babies we would naturally wish to proceed with a

circumcision. We think it cannot be gainsaid that the rapid and complete healing of the umbilical wound by the suture method is a distinct advantage in those cases in which a circumcision is contemplated.

The most important index, however, of the effect of the suture method on the general well-being of the child is the weight curve. In this connection we have thought it worth while not merely to figure out the maximum weight loss of the child, as Adair and other writers have done, but, at the expense of considerable time, actually to plot out in these two series of 225 cases the weight curves for the first ten days. This shows some interesting results, as seen in Chart 2. The average initial weight of the sutured babies was slightly in excess of the ligated babies. The initial drop for the first three days was greater in the sutured babies and persisted for one day longer. From the sixth day on, however, the tables were turned and the sutured babies began to gain more rapidly than the ligated ones. The actual figures were those given in Table 2.

The interpretation of these variations that naturally suggests itself is that the sutured babies are to a certain degree unfavorably affected during the first four or five days as a result of the surgical removal of the cord, but that when at the end of that time the umbilicus has fully healed, these children gain more rapidly than the babies with ligated cord. Unfortunately a considerable percentage of mothers were compelled to leave the hospital after ten days, so that records were incomplete for the following days. While it is unsafe to rely solely on impressions, we believe that the gain of the sutured over the ligated babies from the sixth to the tenth days persisted during the following week. In other words, although suturing the cord at the outset is an increased tax on the strength of the newborn child, after the immediate effects are worn off the more rapid wound healing of the sutured navel brings about a gain in weight proportionately greater than in the child with ligated cord.

TABLE 2.—WEIGHT CURVES

Day	Ligated Cord		Sutured Cord	
	Weight, Gm.	Change	Weight, Gm.	Change
First	3,204	....	*3,165	....
Second	3,079	—125	3,038	—127
Third	2,987	— 92	2,960	— 78
Fourth	2,980	— 7	2,979	+ 19
Fifth	3,004	+ 24	3,014	+ 35
Sixth	3,036	+ 32	3,049	+ 35
Seventh	3,073	+ 37	3,074	+ 25
Eighth	3,102	+ 29	3,094	+ 20
Ninth	3,107	+ 5	3,108	+ 14
Tenth	3,136	+ 29	3,124	+ 16

No discussion of the suture method is complete without considering the important saving in the time and responsibility of the nurse in charge. Dickinson speaks of the enthusiasm of the nurses in the maternity division for this method. Our experience was similar. Miss Pommel and her associates at the City Hospital repeatedly expressed their delight over the simplified nursing under this method of handling the cord. Many hours can be saved thereby in the course of each month, hours that can be better employed in other ways, for the care of the mother and the child.

SUMMARY

1. We believe that the suture-ligature method will not greatly decrease the number of umbilical infections. The essential thing is asepsis; and if that is lacking, whether the cord is amputated or ligated is of secondary importance.

2. Umbilical hernias cannot be prevented by this method.

3. The greater immediate loss of weight and greater frequency of slight elevations of temperature after suturing emphasizes the initial shock and the necessity of restricting this method to maternity divisions under the direction of persons of obstetric experience.

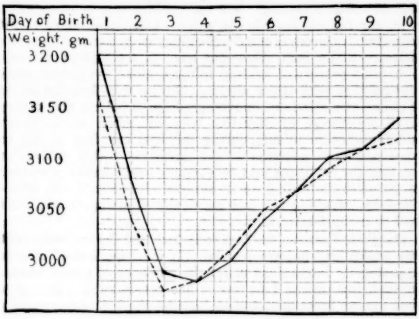

Chart 2.—Weight curve: solid line, sutured patients; broken line, ligated patients.

4. The more rapid gain of the sutured baby after the fifth day shows that the slow healing of the umbilical wound by the ligation method is to some degree a drain on the well-being of the child.

5. The time saved by the nurses when the cord is amputated is considerable, and is of economic importance in the management of hospitals.

6. We therefore urge the adoption of the Dickinson method of treating the cord in all maternity institutions under due precautions. We could find no valid objections to its use; on the contrary, it has certain definite advantages which, though not great, should make it the preferred technic in the treatment of the cord at birth.

ABSTRACT OF DISCUSSION

DR. GEORGE M. BOYD, Philadelphia: Dr. Dickinson's method of ligation of the cord has, undoubtedly, certain advantages. The essayist has shown us, however, that in a certain proportion of cases infection followed. He also shows by his chart that there was a greater elevation of temperature in the first week of the puerperium. We have, therefore, these two factors to consider — the greater elevation of temperature, and the fact that the method will not eliminate infection to as great a degree as I had hoped when I first read Dr. Dickinson's paper.

Obstetric work is emergency work, to a certain degree, and it will always be. While, in the hands of those who are practicing obstetrics as a specialty, this method of treatment of the cord may be carried out in many cases to advantage, since the length of labor, time of delivery, and the presence of the obstetrician are uncertain, the older method of ligation, I think, must still be taught. I should feel, then, that while this method has certain advantages, the older method must still have a field of usefulness.

DR. CHARLES S. BACON, Chicago: I have not practiced this method, but have for a number of years tied the cord right at the junction of the skin and have found that very satisfactory. It obviates the difficulties that are encountered when the cord is tied half an inch or more away from the

skin. There is practically no more trouble in the dressing of the cord thus tied than if the cord were not there. The only thing I do is to pour alcohol over the site at the regular dressing of the baby. I have seen no trouble at all. Therefore, the advantage mentioned by Dr. Taussig in the economy of the dressing would not apply to the cases as I manage them.

DR. ASA B. DAVIS, New York: I have not practiced this method of suturing the umbilical stump. In our hospital service we ligate the cord about 1 inch from the abdominal wall. Dr. Taussig calls attention to the fact that infants do not gain until the umbilicus ceases to granulate and is well started towards healing. We can confirm this by many cases of minor degree, and also in a few exaggerated cases of the so-called "carneous stump," sometimes from one-half to three-quarters of an inch above the level of the abdominal wall. A tedious process of healing follows, aided by cutting away granulations with silver nitrate. During this time the infant is either at a standstill or retrograding. I believe that a very large percentage of digestive troubles, green stools, fever, and jaundice in infants during the first ten days is due to some grade of infection at the umbilicus. This method of treating the umbilicus may be valuable in the hands of trained surgeons in obstetric hospital service. Its general use, sometimes by unskilled and not surgically clean operators, must lead to many fatal results.

DR. F. J. TAUSSIG, St. Louis: I feel that the method is not one which will become popular. It must be limited largely to maternity institutions under the guidance of expert hands. In such institutions I believe it has considerable value as a time saving procedure, and in limiting those rare but serious epidemic infections that occasionally prevail in all maternities.

THE REPAIR OF CLEFT PALATE

A TECHNIC AND THE REASONS FOR IT*

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SAN FRANCISCO

Cleft palate, a pure deformity, has no pathology. Its incidence and the part heredity plays in its production have long been studied by Mr. William F. Blades of the Eugenics Record Office, but no deductions can be drawn from the data as yet collected; so we must pass by this interesting phase of the condition, as well as its anatomic complex.

The description of a method for the repair of a cleft palate will be limited to the single sided complete cleft. This is the most common lesion. All technical details applied to it are also applicable to other varieties of the deformity without special indication.

The time at which to operate is of initial importance. I wait until the child has passed the first three or four months of life and has established a satisfactory state of health. I advocate and practice operating before the eruption of any teeth. The infant's mouth at this time is not a too septic place, and sepsis is the greatest obstacle with which we have to contend. This is, of course, long before the incidence of infection of the tonsils or of the pharyngeal adenoid tissue, and also long before the child learns to speak or to attempt any imitation of the voice sounds he hears. It results that we come to the beginning of the work when the child weighs about 15 pounds.

The first step is to narrow the cleft by elastic compression. Commonly the halves of the uvula may be seen to be close together or even touching, separating, however, when the child opens the mouth, in front and at the back, to cry. The widest part of the cleft is at the front, and the intermaxillary bone projects well in advance of the maxilla on the opposite side of the cleft (Fig. 2). I deprecate measures which perforate the maxillae for the passage of wires to draw the bones together, chiefly because of the possible interference with budding teeth, and the danger of a sequent sepsis. It is possible to draw the bones materially together — so as to make the intermaxillary overlap the maxilla — by elastic band traction, pulling on hooks of the hook and eye variety, fastened in adhesive plaster which is stuck on the child's cheeks (Fig. 1). When the child is quiet, the elastic is steadily drawing the bones together, and its effect is much enhanced when the child laughs or cries. The anterior and middle parts of the cleft are definitely narrowed by this means, as can be seen in the improvement in the appearance of the nose, the flattened nostril and tense ala being deepened and relaxed. As soon as the ends of the broken alveolar arch overlap, the child is ready for the operation on the sofe palate.

Fig. 1.—Detail of adhesive plaster and hook and elastic compression of the maxillae narrowing the cleft. Note that the inner end of the plaster is put on the cheek outside of the side of the nose and that the posterior end runs up as high as the top of the ear.

All operators today are practically using the Langenbeck or the Lane method of closing the soft palate. The former, recognizing that the cleft represents a failure of union, attempts to correct that fault by putting the parts in union with the least disturbance of tissues. The Lane method splits the velum between its pharyngeal and buccal sides, and turns flaps over from one side to the other. This necessarily jeopardizes the palatal muscles in the splitting, and results in extensive scarring in healing.

The Langenbeck method can be so done as to disturb the muscles individually not at all, though they are, as a group, moved toward the middle line. The statement that the Langenbeck method is inadequate in a wide cleft with a flat palatal arch does not apply to the velum; therefore the Langenbeck is the method I use.

Now, instead of paring the sides of the cleft to get raw surfaces for union, I split them from the attachment of the velum to the tips of the uvular halves. I now suture the posterior edges of the split uvular

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

halves together, tying the knots in the pharynx (Fig. 2), and follow by uniting the anterior edges, tying the knots in the mouth (Fig. 3). By this plan I avoid

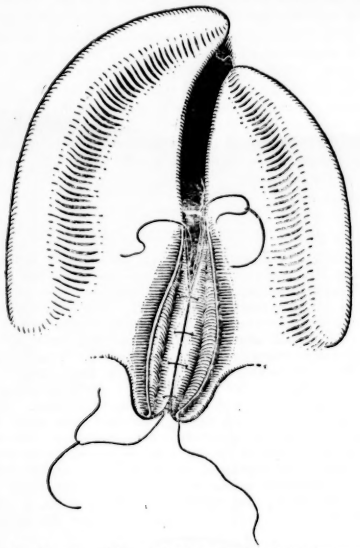

Fig. 2.—Schematic showing of the projection of the intermaxillary bone beyond the maxilla. The margins of the soft palate have been split along their contiguous edges. The posterior flaps are drawn together by sutures which are tied on their pharyngeal surface.

sacrificing any tissue, and if secondary or other sutures are needed, I have all of the original tissue up to the very end. Again, I get broader surfaces of contact for union, though this seems, in failing cases, to be a matter of doubtful value. Finally, I can plan the sutures so as to avoid strangulation of any part of the uvula; and this is a matter of importance, for a shrunken uvula materially limits the palate's usefulness in phonation and deglutition. The plan of splitting the uvula and velum I think originated with the late Hugh Alexander Ferguson of Chicago.

This double pharyngeal and buccal suture line is necessarily stopped at the edge of the hard palate; anterior to that point I use only a buccal suture, and I mattress it. By this means I turn down the edge of each side into the mouth, get broader surfaces of contact for union, and thicker tissue after healing where formerly it was too thin (Fig. 3). I do not attempt to come farther forward by this plan than half the length of the hard palate. This leaves me plenty of tissue in front for the blood supply. I make, on each side, lateral incisions, keeping them outside the posterior palatine foramina and carrying the posterior ends well back. This lets me lift up the whole of the soft palate and move it toward the middle, and to do the same with the mucoperiosteum of the posterior half of the hard palate (Fig. 3). Now around these two flaps, mobilized and approximated and sutured, I pass a piece of ordinary tape, saturated in Moorhof-Mosetig bone wax. This is caught by a stitch, at both the front and the back, on each side, and is so sutured that it acts as a relaxation suture; as it is somewhat stiff, it is also a sort of splint, and immobilizes the soft tissues involved (Fig. 4). The part where my repaired palates begin to break down is at the junction of the hard and the soft palates. Here the strain seems to be greatest or the circulation poorest. In the bight of my tape the flaps cannot pull apart, the mattress sutures are not torn out, and union must occur. Finally, for purposes of cleanliness, I pack the lateral incisions with iodoform gauze.

The tape is left undisturbed for from ten or twelve to fourteen days; the gauze packings are changed daily until the incisions heal so much that they will not hold the gauze.

Union now gives us a palate with a somewhat shortened uvula, and this is usually destined to become still shorter as contraction of the scar tissue occurs. I have never seen a normally long velum after the operation, but I have seen them very nearly normally long, and with an active musculature, showing that I had not spoiled the nerve supply.

During this period the cheeks and the maxillae are held by the elastic traction, and I now repair the lip so that it shall remodel the alveolar processes and make an approximately normal alveolar arch. I shall not impose on any one the way in which I repair the lip. It is something in accordance with a method I once saw practiced by Charles H. Mayo. Each man must find out the way in which he can do this dainty bit of work best, and follow that way.

In the front of the mouth the mucosa is tightly applied to the bone, and the material for any sliding

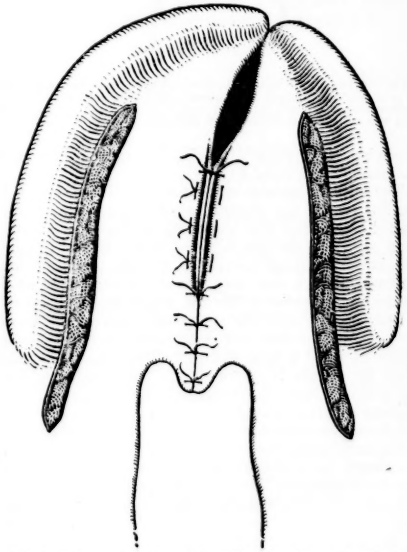

Fig. 3.—The anterior flaps of the split soft palate and uvula have been sutured in the mouth. The mucoperiosteum of the posterior half of the hard palate has been mobilized by the lateral incision and by being separated from the bone, and the edges united by mattress sutures closing the cleft. The lateral incisions are stuffed with iodoform gauze.

plastic is lacking. Here is, however, a perfect place for a Lane flap, not made so big as to open and ruin tooth follicles, but broad enough to bridge the cleft

and long enough to close the whole length of the cleft left open. I take the flap from the wider side and pocket it under the mucosa of the narrower side. It is quite competent to do this to just behind the teeth and to leave no opening, a condition which is most

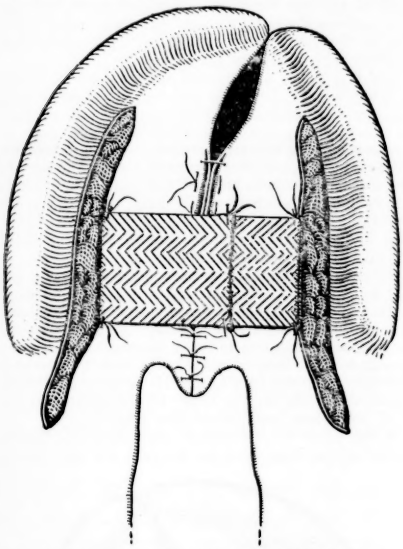

Fig. 4.—The waxed tape in position stitched where the ends meet, so as to maintain a proper tension, and caught by a stitch on each side, in front and at the back to keep it from rolling up into a string. The bone wax stiffens it and prevents its becoming saturated with saliva.

annoying, as it readily permits leakage of fluid into the nose (Figs. 5 and 6).

The suture material is of moment. In the uvula I use fine twenty day chromic catgut or horsehair or fine waxed black silk. The wax really is Moorhof-Mosetig bone wax, and the silk is boiled in it. Horsehair and silk have the disadvantage of usually having to be removed, though they may tear out of their light hold on the uvular mucosa. In the velum and in front of it I use black waxed silk or fine silkworm gut. This is for the sutures that are mattressed, and it is good policy to leave a long end to facilitate picking it up when the suture is removed. In the front part, for the tacking into its pocket of the Lane flap, the chromic catgut is enough.

I have used the body weight of 15 pounds as an index as to when the child is ready for the operation. Frequently these children are undernourished because they have difficulty in sucking a nipple on a breast or a bottle. So I have them all fed by a catheter in the nose. In a short time a child will learn to acquiesce in the method, and we can be sure that it really is getting a proper amount of food and without undue effort. After the operation, when the palate is freshly sutured, it is a definite advantage to eliminate the muscular act of swallowing and the consequent strain on the sutures in the soft palate. By this method it is quite possible to keep the child gaining in weight through the whole of the operative phase.

In operations on these children the anesthesia is ether, and the ether vapor is blown in through a soft rubber catheter which is fastened by a stitch in the nose, the stitch passing through the septum. The end of the catheter must reach only to the posterior nares. The child's head hangs half over the edge of the table, and is supported by a little shelf. I use a large complex gag, which holds the mouth open, holds the tongue forward, and pulls the corners of the mouth outward. Around the whole operative field I have black or dark blue cloths, sheets, towels, gowns, etc., to obviate the glare of the ordinary white environment. By this means the mouth is in the high light, rather than in the shadow.

350 Post Street.

ABSTRACT OF DISCUSSION

DR. VILRAY P. BLAIR, St. Louis: The Brophy operation was used fifty years ago by an Australian. The Lane is but an enlargement of the Cawley flaps and the Davis could be called a Warren with equal justice. The relationship of various technical steps to each other and to the age of the patient are much more important than the choice of the technical steps themselves. Dr. Sherman has brought out a new and useful technical step. In almost every step of his work and mine we differ radically and I would not have the idea that one technic was any better than the other. As to the matter of age, I am firmly intrenched with those who believe the earlier an operation is done the better. The best time for the closure of the lip is the first twenty-four hours, on account of the feeling of the parents; the second reason for early operation is the ease with which the bones are molded into place; and, thirdly, at this age shock is not a consideration. As to the soft palate, I use the straight

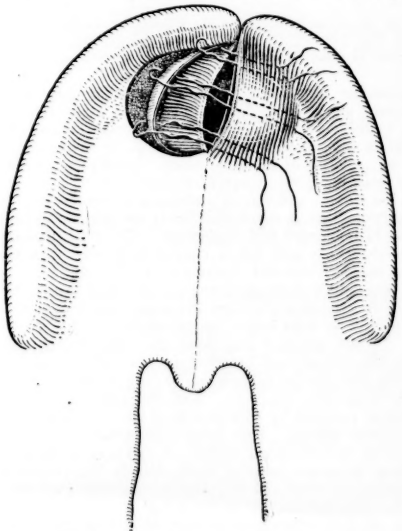

Fig. 5.—The little Lane flap partly turned up, the pocket on the opposite side made ready, and the suture to draw the flap into the pocket placed. The elastic traction and the repaired lip have remodeled the alveolar arch into a normal shape.

Langenbeck operation. If one will wait until the child is 14 months old one can close the whole palate with ease in two operations. There is just enough tissue at birth to close the

palate. After a year we have 39 mm. to close 38 mm. and a space. We must accommodate the methods to the age in this work. In all of these cases there is a considerable spreading of the nostril which will necessitate an operation on the floor of the nose to round it up as on the other side, but where the

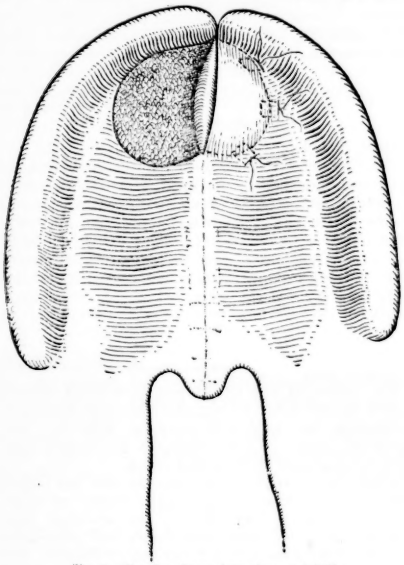

Fig. 6.—The flap drawn into place and held.

cleft remains wide open for a long time, for perfect closure of the lip there must be an operation to restore the nostril. The Brophy operation is usually not practical after three months. Some cases may be closed by elastic traction of a rubber band. There is no end of tricks that one must resort to in this work.

DR. TRUMAN W. BROPHY, Chicago: There are fifteen different congenital defects of the palate, treatment of which requires methods of procedure sometimes slightly and sometimes radically different from all the others. The premaxillary bones are sometimes absent. In that case the fissure is almost invariably in the central line and the nasal bones are deficient.

Having operated on about 4,000 patients with cleft palate, I am convinced that when the alveolar processes are not cleft the operation should be deferred until the patient is between 12 and 14 months old; and that when the alveolar processes are cleft, as well as the whole hard palate, the patient should be operated on in early infancy, before the fifth month.

In complete cleft palate what is accomplished by first closing the lip? The greater deformity is concealed but the cleft is not closed as it should be. By drawing the lip together the anterior part of the hard palate is approximated, but not the enormous breadth of the tuberosities of the jaw. Had the bones been approximated in infancy, the patient would have a normal arch, but this is abnormal. The bones should be put together and fixed so they will unite. To do this the intervening soft parts and compact bone should be removed, the cancellated bone exposed so it will meet cancellated bone and thus be approximated and held quiet until the bones firmly unite. That is the essential thing to do. If there is any better method to pursue than the one I have devised, then let it be made known. A complete cleft palate is not unlike a fracture of bone, separated sutures, or an ununited fracture. I have never done a Langenbeck operation and I never will, for the reason that the Langenbeck operation calls for lateral incisions in the soft parts.

DR. WALTER B. SWIFT, Boston: I want to emphasize one point omitted in cleft palate treatment. It is the after-treatment. The majority of these patients have some speech disorder which persists long after the operation. The chief object of that operation should be the perfection of speech. In the Massachusetts General Hospital we have, in our speech clinic, evolved a system for the perfection of speech in these cases. Several now possess perfect speech.

DR. HARRY M. SHERMAN, San Francisco: It is a question as to whether the lip should be operated on early or late.

When you put in a needle, little or big, and touch the tooth germ you have penetrated the capsule, and by moving the needle around to find a way between the teeth you inevitably make a relatively big hole. I shall never attain the skill which will enable me to pass between these closely packed-in tooth follicles and pull a wire through without wounding and infecting the follicles.

As regards the tensor palati muscles, I make the incision outside the hamular process and so do not cut them off. I move all of the tissue implicated inwards, and that must stretch the nerves which supply the muscles but may not tear them off, because two or three years later in life I have seen these palates move. Dr. Charles H. Mayo used to put a piece of gauze round the mucoperiosteal flaps as a drain. I use tape instead of gauze, and wax it so that it cannot soak up saliva and perpetuate septic infection in the mouth, and then adjust it to be a relaxation suture. That is my innovation.

Of course training these children to speak is a very important matter. It is especially important in those families in which bad English and bad enunciation are the habit. In families in which good English and good enunciation are the habit, children will speak very well without much special instruction, though they will speak better if they have it.

PREMATURE DETACHMENT OF PLACENTA, WITH DELIVERY OF A LIVE BABY BY CESAREAN SECTION

DAVID S. HILLIS, M.D., Chicago

Attending Obstetrician, Cook County and Provident Hospitals; Assistant Obstetrician, Chicago Lying-In Hospital; Instructor of Obstetrics, Northwestern University Medical School

Mrs. S. G., aged 35, primipara, was in the ninth month of pregnancy. For the past thirty days there had been a small amount of albumin with no casts in the urine. The maximum blood pressure was 120. May 12, the patient was struck in the abdomen by the head of a 3-year-old child, who threw himself in her lap. This caused considerable pain at the time, but was soon forgotten by the patient. May 16, four days later, the patient walked seven blocks; when near her house she was taken with moderately severe pain in the lower abdomen and back, which was continuous, not intermittent. One hour later, fresh blood was discharged from the vagina, in small quantities but continuously. The patient thought that she lost about 4 ounces of blood during the first hour or two. At 3 p. m. (three hours after the pain had started), examination at the Chicago Lying-In Hospital showed: General condition of patient excellent; no signs of shock; pulse 94; color good; fundus one finger below ensiform; uterus tense with increased tenseness at intervals of about two to six minutes, accompanied by pain. Pain, however, was constant in lower abdomen and back. Fetal parts were difficult to outline on account of tenseness of uterus, but back seemed to be to the left, head movable, floating above inlet. Fetal heart tones were 140 to 148 left lower quadrant, regular, rhythmic, but somewhat variable during a minute's observation.

Rectal examination showed cervix not effaced, about 3 to 4 cm. long. The os hardly admitted one finger. During this examination about one-half ounce of very dark colored semifluid blood was expressed from the vagina. At 4 p. m.

the heart tones went to 176, with slight irregularity; otherwise the condition remained the same. At 5:30 p. m. the heart tones were 164 to 168, and somewhat irregular. There were slight uterine contractions, irregular, at intervals of from three to seven minutes. There was constant pain in the back and the lower part of the uterus. Palpation of the uterus immediately caused a tenseness of the uterine wall, equal to the painful contractions which came on spontaneously; the uterus at all times was firmer than normal, and slight bleeding from the vagina continued, some of which was bright in color. Rectal examination showed no change from the findings at 3 p. m. More thick dark colored blood was expressed from the vagina.

At 6:30 p. m. under ether anesthesia, classical cesarean section was done. The child was not asphyxiated. On removal of the baby, a clot of blood was seen lying in the opening of the uterus, and on introducing the hand to remove the placenta, the clot was expelled on to the abdominal wall. The position of the placenta in the uterus showed that it was not praevia. This clot was in shape a circular biconvex disk, 14 cm. in dameter and 4 cm. thick in its middle or thickest portion. It weighed 15 ounces. The surface and edges were smooth and regular in outline, except in one part of the circumferance, where there was a small clot about 4 cm. in diameter, ragged and somewhat irregular in outline. This was attached to the edge of the main mass. This clot was very firm, dark, almost black, and retained its integrity in spite of much handling for examination, weighing and measuring. The placenta was lying on the posterior wall of the uterus, with its edges near the incision in the uterine wall as the uterus contracted after removal of the baby. The uterus did not contract well after the removal of the placenta, and 1½ ampules of pituitary extract were injected into its wall directly. This caused a fairly satisfactory amount of contraction, but less than is usually secured by the administration in the same manner of 1 c.c. of the drug. During the suture of the muscle walls, it was noticed that the peritoneum over the entire surface of the uterus appeared mottled, which was evidently due to small hemorrhages under the serosa. The uterus had been subjected to only a minimum amount of traumatism and manipulation. This mottled area was seen on the posterior surface, as well as on the sides and anterior surface, those on the anterior wall not being over the placenta site. The uterus now was contracted in a satisfactory manner, and it was decided not to remove it. The macroscopic appearance of the muscle wall in the incision was normal. The placenta was circular in shape, 30 cm. in diameter; the cord was centrally implanted, and the fetal surface showed no abnormalities. The maternal surface did not show a well marked area of depression, corresponding to the size of the clot, although there was a considerable area, irregular in shape, where the placenta was thinner than the rest and somewhat paler.

The diagnosis was based on the history; the sudden onset of the pain; the character of the pain; the marked irritability of the uterine muscle; the abnormal tenseness of the uterus, and the bloody discharge appearing one hour after the onset of the pains; and in spite of the continuance of the heart tones and the absence of signs of shock on the part of the mother, the absence of these two signs was accounted for by the fact that the separation was not of sufficiently large extent to kill the baby or produce shock; although, in these cases shock is usually present out of proportion to the amount of hemorrhage and apparent traumatism. The patient, who was a robust woman, went home with her baby in excellent condition on the fourteenth day.

The case presents several points of interest:

1. The presence of signs and symptoms definite enough to justify a diagnosis before the death of the baby.

2. The hemorrhagic condition of the entire uterine surface corresponding to Williams' idea of the pathology of premature separation.

3. The value of pituitary extract injected directly into the uterine muscle in these cases.

106 South Michigan Avenue.

Military Medicine and Surgery

CLINICAL MANIFESTATIONS AND TREATMENT OF GAS POISONING

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FRANCE

The ingenuity of the German mind has long been recognized. During the past three years this ingenuity has made itself felt by devising diabolical schemes for the destruction of life—both combatant and noncombatant. Submarine warfare was expected; liquid fire was a possibility; but poison gas was utterly unknown until used by the Germans during the second battle of Ypres in the spring of 1915. Since then, poison gas has been used by all belligerents with telling effect. Since July 19, 1917, our enemy has used a new preparation which for want of a better name is called "mustard" gas.

The victims of this gas present a clean-cut clinical picture characterized by conjunctivitis with excessive lacrimation, laryngeal and bronchial irritation, and superficial burns. These symptoms are usually preceded by epigastric distress and emesis.

When one is exposed to the gas, an odor not unlike mustard is experienced, followed in a number of hours by the symptoms mentioned. The so-called free interval, rarely less than four hours and practically never more than sixteen, is explained by the fact that this "mustard" gas decomposes on exposure to moisture, the symptoms resulting from the action of the products liberated by the decomposition.

SYMPTOMS

The victim, although knowing that he has been exposed, feels perfectly well and usually continues to "carry on" until relieved from duty. The first evidence of trouble usually occurs hours later, when he may be awakened by epigastric distress and violent vomiting, followed soon afterward by the cardinal symptoms:

1. The conjunctivitis is severe; photophobia is common and lacrimation profuse. Puffiness of the eyelids is constant in the severer cases. Corneal involvement is very rare.

2. The laryngitis and bronchitis are primarily irritative—not inflammatory—and nonfebrile. A sense of constriction about the larynx and tightness of the chest are early and usually persistent symptoms. Aphonia is common but usually evanescent. On the other hand, the cough occurs early and is the last symptom to disappear. It is paroxysmal in character, particularly severe at night, and accompanied by a serious discharge in light cases, hemorrhagic expectoration in the most severe, and purulent in the late cases secondarily infected or complicated by bronchopneumonia.

3. The exposed parts, for example, the face, hands, forearms, and in the Kilties the knees, are most commonly affected by burns; frequently the genitals, buttocks, shoulders and back are severely burned; the feet are but rarely involved. During the first forty-eight hours the skin may be merely pigmented, presenting

a blackish, brown appearance, and harsh to the touch. After a number of days, desquamation takes place. More often, however, there is distinct blistering, the vesicles varying in size from a millet seed to 4 or 5 inches in diameter. The burns usually involve only the superficial layers of the skin, although second degree burns are not uncommon. It is our belief that all the symptoms enumerated above are the result of chemical burns; that the mucosae of the eyes, larynx and bronchi, as well as the skin, are excoriated by the gas.

PHYSICAL EXAMINATION

In addition to the conjunctivitis and skin burns, examination reveals a diffuse bronchitis, usually nonfebrile, with hurried breathing. True dyspnea is rare except in the very severe cases complicated by bronchopneumonia, or when pulmonary edema develops. Occasionally, the heart is enlarged to the right, with an accentuated second pulmonic tone. The blood pressure, systolic and diastolic, is slightly reduced. The blood picture is in no way characteristic. Slight eosinophilia (from 3 to 5 per cent.) has been noted in patients suffering extensive burns.

The course of this syndrome is self limited, and depends entirely on the amount of damage done and the time elapsing between the gassing and the institution of rational therapy. Complications necessarily modify and alter the prognosis. In very severe cases, pulmonary edema may develop early; and death may occur a few hours after the onset of symptoms. On the other hand, in the lighter cases, convalescence is rapid.

COMPLICATIONS

Bronchopneumonia is unquestionably the most common complications with which we have to deal. It usually comes on from seventy-two to ninety-six hours after the exposure to the gas, and frequently runs a turbulent course with high fever, intense dyspnea and cyanosis, cough, and not uncommonly bloody expectoration. The termination is either by lysis in two to three weeks, or fatally in a few days from a superimposed pulmonary edema *which is not of cardiac origin.* Unlike the chlorin gas, this more recent product affects the heart but little. The myocardium, as demonstrated by necropsy, is not damaged. To be sure, at times the heart is enlarged, transversely; but this is purely compensatory, as the pulmonary changes necessarily increase the work of the right ventricle. Albuminuria is not uncommon, but true nephritis has been extremely rare in our experience. This is quite remarkable, as the burns involving skin and mucous membranes are frequently quite extensive.

We regret exceedingly that we cannot discuss prognosis. The cases which have come under our observation included every degree of severity; some of the patients were ready for duty in a few days, while other cases were severe, with and without complications. Also, the number has been sufficiently large to justify very definite conclusions. To publish these conclusions would be unfair to our allies and ourselves, and might be of value to our enemy.

TREATMENT

The intensity of the symptoms depends largely on the rapidity with which treatment can be instituted. We suggest the following procedure, viz.:

1. Knowing that this gas decomposes on exposure to moisture, we consider it highly important that the victims be given an entire change of dry clothes as soon as is practicable, and that dry sleeping quarters, preferably above ground, be procured.

2. Phlebotomy should be performed for the early pulmonary edema which develops in the very severe cases.

3. Oxygen inhalations are of questionable value, but should be tried.

4. The eyes should be irrigated with boric acid solution; alkalis should be used internally, and 10 per cent. sodium bicarbonate solution should be applied externally for cutaneous burns.

5. For the distressing paroxysmal cough opiates are indicated, preferably codein or heroin, in sufficient dosage to allay the irritation of the respiratory mucosa. Antispasmodics, such as belladonna, apparently aggravate the respiratory symptoms, owing to their drying effect.

6. Complications should be treated as they arise.

SUMMARY

1. An interval (from four to sixteen hours) of freedom from distress exists between the actual gassing and the onset of the symptoms.

2. The cardinal symptoms, conjunctivitis, laryngitis, bronchitis and skin burns, are all due to the excoriating effect of the gas.

3. The principal complications are early pulmonary edema and relatively late bronchopneumonia.

4. Dry clothing and sleeping quarters may prevent the development of symptoms after slight exposure, and possibly may lessen the severity in those more severely gassed.

[EDITOR'S NOTE.—The "mustard gas" from German shells is well known to the Allies in regard to its composition and the steps to be taken to protect against it. The gas is liberated from liquid in the shell; and when the liquid is scattered on the clothing or skin, or when the men move over ground wet with the liquid, burns will result. Protection against the liquid should be care to avoid contact. The liquid is dichlorethylsulphid. As the gas has very little odor, the men may delay in applying their respirators and be gassed or, in order to have better vision, they may neglect to adjust the whole face-piece and suffer a lacrimatory effect. The eye symptoms disappear, and no permanent injury results. The English box respirator is a complete protection to the eyes and lungs against the gas.]

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

ATOPHAN.—A proprietary brand of phenylcinchoninic acid. It complies with the standards for phenylcinchoninic acid, U. S. P., but melts at from 208 - 212 C.

Actions, Uses and Dosage.—See New and Nonofficial Remedies, 1917, p. 239, under Phenylcinchoninic Acid and Phenylcinchoninic Acid Derivatives.

Manufactured by Schering and Glatz, New York. U. S. patent No. 1,075,171 (Oct. 7, 1913; expires 1930). U. S. trademark No. 84,596.

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SATURDAY, DECEMBER 8, 1917

INFLUENCE OF THE SEX GLANDS ON DEVELOPMENT

The influence exerted by the genital glands on the other parts of the reproductive apparatus, and on the body generally, is a remarkable illustration of the chemical correlations that may exist in the organism. That the lack of the sex glands—a situation which arises as the result of castration—may bring about conspicuous alterations in physique and modifications of the expected development is a fact long familiar. When the removal of testes or ovaries is carried out early enough, that is, before the period of puberty, the development of the so-called secondary sexual characters is interfered with. We must regard the germ cells, says Starling, not only as representing the cells from which the individuals of the new generation may be developed, but also as concerned in the formation of chemical substances which, discharged into their hosts, affect many or all of the functions of the latter, with the object of finally subordinating the activities of the individual to the preservation and perpetuation of the species.

Even more striking than the long observed failure of development in the absence of suitable hormones furnished by the sex glands, a result that is essentially negative in character, are the positive alterations in bodily evolution that result from the introduction of female factors into the developing male, and vice versa. By means of transplantation experiments, in particular, it has been possible to show that the sexual glands direct an influence on sex characters through something resembling an internal secretion. Remarkable instances have been afforded by Steinach[1] in particular. For example, he transplanted to castrated young male rats and guinea-pigs the ovaries of their sisters; the males became in weight, size, and in all proportions of their body like females. The mammary glands were highly developed and even secreted milk, whereas the growth of the penis was obviously inhibited. On the other hand, young castrated female guinea-pigs increased in weight and size after implantation of testes, and became in all the proportions of their body like males. The castrated male is feminized by the ovary, the castrated female is masculated by the testis. Besides, the feminization and the masculation in the experiments of Steinach were also manifested in the transformation of the sexual behavior of the experimental animals.

It is apparent from this and other evidence which might be cited that the hormone of the sex glands acts in a sex-specific character, as Lipschütz[2] has recently termed it; that is, the male gonad furthers the development only of male sex characters and inhibits the development of female sex characters, whereas the female gonad furthers the development of female sex characters and inhibits the development of male sex characters.

Steinach has gone a step farther in recent years in suggesting that the organism is nonsexual until it has reached a definite stage in embryonic development. The sexual transformation of the body is believed by him not to begin until the puberty gland has become differentiated into male or female. In support of this view, Lipschütz cites the observations that a castrated hen assumes the plumage and the spurs of a cock, whereas it is well known that the castrated cock keeps his plumage and spurs. From these facts, he adds, we must conclude that the development of the male plumage and the spurs does not depend on stimulation by the male sexual gland, whereas the female sexual gland transforms a male-kite plumage into a female one and inhibits the growth of the spurs. The male plumage and spurs become male sex characters, according to Lipschütz' interpretation, not because they result from an action of the male sexual gland on the nonsexual soma, but because the development of these nonsexual characters is influenced in the female by the internal secretion of the female sexual gland. The hormones of the sex gland may thus further or inhibit the natural continuance of conditions foreshadowed in the embryonic form.

1. What Determines the Development of the Secondary Sexual Characters? editorial, THE JOURNAL A. M. A., Feb. 17, 1912, p. 484; The Modification of Secondary Sexual Characters, Feb. 21, 1914, p. 618.

2. Lipschütz, A.: On the Internal Secretion of the Sexual Glands, Jour. Physiol., 1917, **51**, 283.

THE BANANA AGAIN

Several years ago we called attention to the banana as an undervalued source of nutriment.[3] The defense of this fruit, which ought to be available at comparatively low cost in times of normal commerce and transportation facilities, almost invariably provokes protests from persons who maintain that the banana is a cause of indigestion and a treacherous dietary component which is at best to be looked on as a luxury, harboring insidious dangers to alimentation. Since our earlier comments in which the fallacies of the still current prejudice against the banana were

3. The Undervalued Banana, editorial, THE JOURNAL A. M. A., Jan. 27, 1912, p. 276.

exposed, several investigations, notably those by A. R. Rose and others at the New York Post-Graduate Medical School and Hospital, have served to fortify the wider use of the banana as a wholesome, palatable and nutritious article of food. The latest of these dietary studies[4] has even gone so far as to put beyond criticism the appropriateness of the banana as a food for young children.

What is the banana, from the standpoint of the student of nutrition? It is essentially a highly edible source of carbohydrate comparable, in its richness of foodstuffs, with the most popular of fruits. Like other members of this group of products, the banana undergoes specific changes in the course of its ripening. The nutrient carbohydrates in the banana comprise essentially one fifth of the entire fruit. In the green specimens this carbohydrate is in the form of a starch, but on maturing this is converted first into sucrose and finally into invert sugar. The proteins amount to less than 1 per cent., and their nature is at present unknown. The fat and fiber are negligible. The ash is important both in amount and in the kind of its constituents. Looked at simply as a source of food fuel or energy, the banana yields over 400 calories per pound. Olives, sweet potatoes and corn are the only common fresh fruits and vegetables that have a higher fuel value than the banana. Other fruits and vegetables that may be classed with the banana as having approximately 1 calorie per gram are grapes, plums and potatoes, together with figs, which are almost identical with bananas, and dates, with a fuel value equal to that of grapes.

Raw starch has not proved to be a satisfactory nutrient for the human body. No one thinks of eating the starchy potato uncooked; and the tolerance of the human alimentary tract for the uncooked starchy chestnut has decided limitations. It is obviously unwise, therefore, to expect the raw banana, eaten in the stage in which much unconverted starch still remains in the fruit, to prove free from the same objections that apply to other unripe or uncooked starchy foods. Even the green banana can be eaten with impunity if the pulp is thoroughly cooked, as is done in the case of the comparable potato. The chief reason for the unfavorable reputation attained by the banana, when eaten uncooked, appears to lie in the failure of most persons to understand what a ripe banana really is.

The chemist has closely followed the changes that the skin and pulp of the banana undergo simultaneously during ripening, a process facilitated by heat in the presence of air. Bananas that are merely yellow are not ripe. Pease and Rose remind us, in harmony with numerous published analyses, that characteristic changes take place in the peel as the fruit matures. The thick, turgid covering of the green banana becomes thinner and more pliable; the color passes from green to pale yellow, deepening to golden yellow with brown spots; and finally the peel becomes brown all over. Bananas are edible raw when the brown spots appear, and need not be refused as overripe when the peel is entirely brown if the covering is intact and the pulp shows no signs of fermentation. The brown color of the ripening must not be confused with the brown patches due to bruising.

The proof of the pudding is the eating. Utilization experiments have demonstrated that the underripe banana when baked is utilized to about the same extent as the potato, and is similar to this vegetable in its nutritive value. There has in no case been any suggestion of deleterious effects from eating the banana baked or raw when fully ripe. In the late yellow stage, before the development of the distinct golden color, the raw fruit can be consumed by normal persons in small quantities (say one or two bananas) without discomfort or apparent harm. Nevertheless the recent authors are of the opinion that the raw fruit should not be given to children at this stage. Pease and Rose have conducted enough actual feeding trials on young children to justify the statement that the banana can with profit enter liberally into the child's dietary, provided it is fully ripe or well cooked. If eaten baked in the yellow stage of ripeness, or if eaten raw when fully ripe, the banana makes a delightful and highly nutritious article of food. Its composition does not warrant the use of the banana as the main component of the child's dietary, but it can compete well with other fruits, and is decidedly to be preferred to candies. The nutritional value is relatively high, approximately one calorie per gram of pulp; and its carbohydrates, when it is fully ripe or cooked, are not less assimilable than those of cereals and potatoes. In the raw food, the digestibility is directly proportional to the ripeness of the fruit. There is no positive evidence that the banana influences bowel movements. In the many tests there was no suggestion whatever of any deleterious effect from consuming large amounts of fully ripe bananas. Prolonged use of the underripe fruit, on the other hand, developed undesirable symptoms.

Let the important fact be emphasized again that the banana ought not to be eaten raw until after the brown spots begin to appear. At this stage, we are reminded by the investigators cited, the banana assumes a full golden yellow and is in its most attractive appearance. A completely browned skin, they properly add, is not in itself a sign of overripeness, and such fruit should be judged by the texture of the pulp. The brown color of the peel, however, should not be confused with the darkening due to bruises. An injured banana is soon invaded by molds and yeast cells through the abrasions and the broken end; the banana "finger," therefore, should not be broken from the "hand" or stem, but

4. Pease, M. C., and Rose, A. R.: The Banana as a Food for Children, Am. Jour. Dis. Child., November, 1917, p. 379.

cut off in such manner as to leave a good margin between the cut surface and the pulp.

When we have at length learned to recognize ripeness in the banana and have ceased to eat the unripe fruit because we mistake its yellow tinge as the sign of a wholesome stage, we may further come to appreciate a positive advantage in the "sterile package" represented by the undamaged peel. Bailey's investigations have shown this to be practically impervious to bacteria. Therefore — and this is worthy of distinct emphasis — a banana properly handled is "uncontaminated by dirt and pathogenic germs even if purchased from the push cart in our congested streets." How many other foods that are edible without cooking can make an equally meritorious claim?

MILK PRODUCTION AND DISTRIBUTION

We have several times referred to the growing importance of the economic aspects of milk production and distribution. The cost of milk to the consumer is so intimately bound up with public health interests that it has long been impossible to separate sharply economic and sanitary issues. Under the pressure of war conditions, this relation is becoming closer than ever.

New York investigators have found that in October of this year a definite decrease in milk consumption in that city could be noted. In 2,200 families visited, the daily amount of milk produced had fallen to 3,193 quarts, as compared with 4,797 quarts in the previous year. Coincident with the decrease in amount of milk purchased, there was a shifting from the better grades of milk to the cheaper, 266 families abandoning Grade A milk for Grade B, and sixty-seven changing from Grade B to Grade C. Dipped milk also was substituted for bottled milk, and the sale of condensed milk increased. The investigators found that 2,148 children under 6 years of age were drinking tea and coffee. In view of these facts, it is not surprising that the New York City Health Department believes that the recent increase in infant mortality in that city is due to a decreased use of high grade milk.

It is, indeed, high time that we should have the cost investigations that are now being made or projected in various parts of the country. If competent investigators are armed with ample authority to secure the facts, some interesting results may be anticipated. Certain opportunities for inquiry and reform have been evident for a long time. The waste involved in current distributing methods appeals to the most superficial observer as quite without justification. In the well known Rochester, N. Y., investigation, it was found that in one small section of the city, fifty-seven dealers delivered milk to 363 homes, traveling altogether some 30 miles. The same service could have been given by one distributer traveling 2 miles. Plans for cooperative dealing have been worked out; why are they not put into effect? Committees meet, discuss and decide, but no action is taken. Selfish interests—always a little more persistently aggressive than unselfish—contribute powerfully to a policy of inaction. Some observers express much curiosity as to the profits of the large milk distributing companies, not merely at the present time but during the last ten years. Has the public been getting a square deal?

Then there is the dairy farmer, himself, that potent political factor in all agricultural states. What state official is going to "antagonize" the rural vote? In many state legislatures the country members outnumber those from the city districts. State institutions are dependent on the legislature for their appropriations. Is it a fact that the actual cost of milk production warrants the enormous price increase that has taken place all over the country in the past few months? Crops of the chief cattle foods are said to have been very large in most sections. The cost of producing and storing these foods may have increased, but not greatly for the average farmer, tilling his own soil and milking his own cows. Does the increased price demanded by the farmer for his milk represent a genuine rise in cost production, or is the traffic being charged all it will bear? One responsible health officer over his own signature answers this question in no uncertain way.[1]

It is to be hoped that the investigations now under way will be real investigations, and that the questions here raised will be answered authoritatively. This is no time for hoodwinking ourselves or others, or for being tender with the feelings of selfishly interested groups, or for resting content with half way information or half way measures.

LOW ARTERIAL BLOOD PRESSURE

The emergency of the war, with its countless experiences of surgical shock, has directed attention to the problems of low blood pressure more emphatically than has ever been done before. Recent timely experimental contributions to this subject in THE JOURNAL by Pike and Coombs,[2] Henderson and Haggard,[3] and Guthrie[4] bear witness to the importance and the intricacy of this much debated topic. It would be both futile and presumptuous to attempt in a brief editorial comment to unravel the difficulties presented. It may be worth while, however, to note for the reader less well versed in the phenomena encountered in connection with shock, that low arterial pressure, per se, may be due to at least two quite different causes, apart from failure of the heart itself. An

1. Wright, F. W.: Month. Bull., Dept. of Health, New Haven, Conn., November, 1917.
2. Pike, F. H., and Coombs, Helen C.: The Relation of Low Blood Pressure to a Fatal Termination in Traumatic Shock, THE JOURNAL A. M. A., June 23, 1917, p. 1892.
3. Henderson, Yandell, and Haggard, H. W.: Observations on Surgical Shock, THE JOURNAL A. M. A., Sept. 22, 1917, p. 965.
4. Guthrie, C. C.: Experimental Shock, THE JOURNAL A. M. A., Oct. 27, 1917, p. 1394.

actual deficiency of blood in the circulation, such as occurs after marked hemorrhage, reduces the output of the heart so that it may become insufficient to take the place of the blood flowing through the capillaries. The obvious form of relief for this condition is to replace effectively the fluid lost. Constriction of the arterioles may raise the blood pressure; but as Bayliss[5] has clearly pointed out in a review of the subject, while it is evident that constriction of the arterioles would raise the pressure in such cases, by diminishing the rate of outflow through the capillaries, the result would be to decrease the supply of blood to all organs whose arterioles are affected, so that no real gain would be obtained. There is an abundance of evidence now at hand to show that when arterial pressure is lowered through loss of blood it cannot be brought back except to a certain degree by the injection of simple saline solutions in a volume equal to that of the fluid lost. The fluid thus introduced rapidly leaves the blood vessels, in small part perhaps through prompt elimination by the kidneys, but in far larger measure by passage into the tissues, as has been pointed out by Bogert, Underhill and Mendel.[6] Several investigators have maintained, and in this they are supported by Bayliss, that if the viscosity of the solutions injected to replace lost blood is raised to that of blood, as can be done by using gum or gelatin solutions in saline, the restoration of blood pressure and volume is far less transitory than is the case with saline solutions alone. The difference in this case, says Bayliss, is due to the osmotic pressure of the colloids injected, by which loss of water by the kidneys and to the tissues is prevented. In animals this has been accomplished by the addition of gelatin or gum acacia to Ringer's solution. Colloids that exert no osmotic pressure are ineffective. Perhaps the intravenous injections of glucose as performed by Erlanger and Woodyatt[7] will prove more satisfactory.

But there is another condition of low blood pressure in which the volume of blood is entirely normal, even when the heart is beating efficiently. The result is due in such cases to peripheral vasodilatation. Bayliss has well analyzed this situation by saying that what is here required is clearly to restore the normal tonic contraction of the vessels. In these circumstances an increased volume of blood may be useless or even harmful, if the heart cannot correspondingly increase its output. Even when no sign of heart failure can be detected, however, injections of suitably viscous saline solutions do not produce any permanent rise in arterial pressure in this category of cases. The vasomotor mechanism is not exhausted under these circumstances, so that the employment of suitable substances to act on it may bring success in restoring the pressure. It is a striking fact that a fall of arterial pressure by itself produces peripheral vasoconstriction through nervous channels; and a rise in pressure appears to induce vasodilatation.

These distinctions, already familiar to the intensive student of the circulation, need to be impressed on all who tend to put every instance of low arterial blood pressure into a common category and assign it to a uniform cause. In shock one has to deal with even more complex conditions in which the condition of the venous circulation, the nutrition of the nervous centers, an altered chemical composition of the circulating medium, and perhaps other as yet entirely unanticipated factors referable to the tissues themselves may play the decisive rôle.

5. Bayliss, W. M.: Methods of Raising Low Blood Pressure, Proc. Roy. Soc., B, 1916, **89**, 380.
6. Bogert, Lotta J.; Underhill, F. P., and Mendel, L. B.: Am. Jour. Physiol., 1916, **41**, 189, 219.
7. Erlanger, Joseph, and Woodyatt, R. T.: Intravenous Glucose Injections in Shock, THE JOURNAL A. M. A., Oct. 27, 1917, p. 1410.

Current Comment

CHOLESTEROL ESTIMATIONS IN BLOOD

The rapid development that the clinical chemical examination of the blood has experienced as a diagnostic technic in the past few years has led to the exploitation, so to speak, of various blood constituents as indexes of functional derangement. In some cases these attempts have been successful in offering new or better indications of pathologic conditions that cannot be so well diagnosticated by other means now available. These contributions, notably such as relate to the nonprotein nitrogen, the uric acid, the sugar and the lipoid content of the blood, have repeatedly been referred to in THE JOURNAL. With an extension of the use of microchemical methods in clinical laboratories, and the accumulation of first hand experience regarding what they can reveal in the clinic, a better critique of chemical blood analysis will gradually be evolved, and the demonstrably useful features will be retained as a part of the laboratory routine. This entire phase of clinical observation is passing through much the same stages as were traversed in the development and perfecting of the now highly successful and invaluable methods for the morphologic examination of the blood. With this preface we may refer again to the subject of the cholesterol content of the blood, summarizing the best evidence available up to the present time. The hopes of the past have not all been realized. It seemed likely at one time that hypercholesterolemia would prove to accompany cholelithiasis. Indeed, the formation of gallstones has been charged to a high content of cholesterol in the blood. The latest statistics, by Gorham and Myers[1] of the New York Post-Graduate Medical School and Hospital, indicate that the findings in cholelithiasis are quite inconstant. They conclude that since hypercholesterolemia may be found in many conditions and is not uniformly constant in cholelithiasis, it would seem that the blood cholesterol possesses only a limited diag-

1. Gorham, F. D., and Myers, V. C.: Remarks on the Cholesterol Content of Human Blood, Arch. Int. Med., October, 1917, p. 599.

nostic usefulness in this condition. Gorham and Myers agree with several previous observers[2] in the conclusion that in pathologic conditions hypercholesterolemia is comparatively common, being reported in arteriosclerosis, nephritis, obstructive jaundice and diabetes, though it is not invariable in these diseases. A content of cholesterol lower than normal is a greater rarity, however. It has been recognized for some time to occur particularly in anemias, notably those of the pernicious type. Here it may have considerable significance, especially in view of the reputed antihemolytic action of cholesterol. The possibility of cholesterol administration at once suggests itself; but it is still too early to foresee the result of such procedure with any certainty. The occurrence of an augmented quantity of cholesterol in diabetes is in harmony with the lipemia that so often occurs in this disease; so that cholesterol may perhaps here be taken as an index of the lipoid content of the blood and of diabetic lipemia in general.

NEPHRITIS, BLOOD LIPOIDS AND ACIDOSIS

The pathologic manifestations of nephritis are no longer interpreted solely in the light of the altered excretion of urinary products as a result of defective kidney function. Frequently there are more remote disturbances of physiologic performance attributable in ultimate analysis no doubt to the renal defects of the organism, yet not explicable directly as kidney phenomena. The confusion of cause and effect in relation to nephritis has been illustrated in the occasional coincidence of gout and nephritis. An illustration of an abnormality associated with certain stages of kidney disease, yet not obviously concerned with inability to excrete urine, has been clearly presented by Bloor[3] at the Harvard Medical School in a study of the blood lipoids by the analytic methods so successfully elaborated by him. The abnormalities in severe nephritis were found to be a high content of fat in the plasma and corpuscles, and an increased amount of lecithin in the corpuscles. The cholesterol values remain essentially normal. These abnormalities are the same as are found in alimentary lipemia, and for this reason are regarded as the result of a retarded assimilation of fat from the blood. Bloor points out that the most frequent of other conditions in which abnormalities of the blood lipoids are common is diabetes, and a prominent symptom of severe diabetes is "acidosis"—a decreased "alkali reserve" in the blood. Recent investigations[4] have established the fact that acidosis is frequently a feature of severe nephritis, and in most of the cases of certain types studied, acidosis was probably present, as evidenced by the dyspnea, low carbon dioxid tension in the alveolar air, and coma. Since an adequate alkalinity of the blood and tissues is necessary for their normal functioning, it seems very probable, says Bloor, that the retardation of fat assimilation found in nephritis is one manifestation of a general phenomenon brought about by a decreased blood and tissue alkalinity. After all the defects for which acidosis has recently been made responsible, what detrimental features of a depleted alkali reserve are we to expect next?

2. References to the literature are given by Denis, W.: Jour. Biol. Chem., 1917, **29**, 93.

3. Bloor, W. R.: The Blood Lipoids in Nephritis, Jour. Biol. Chem., 1917, **31**, 575.

4. Peabody, F. W.: Clinical Studies on the Respiration, II, The Acidosis of Chronic Nephritis, Arch. Int. Med., December, 1915, p. 955.

CLEMENCEAU—A PHYSICIAN

The man of the hour in France is Georges Clemenceau, noted as an editor, as Prime Minister of France, as a "wrecker of cabinets," and characteristically as "the stormy petrel of French politics." It will come as a surprise to physicians to know that this conspicuous figure in the political life of France is a physician, the son of a physician, and that for a time, according to the New York *Times*, he practiced medicine in Stamford, Conn., and in New York. Clemenceau was born in 1841, was licensed to practice medicine in 1865, and between 1865 and 1869 established himself on West Twelfth Street in New York City. Failing in the practice of medicine, he became an instructor of the French language and literature in Miss Aikens' Young Ladies' Seminary at Stamford, Conn. Here he married one of his pupils, Miss Mary Plummer of Springfield, Mass. He returned to France in 1870. Of his career as a physician but little is known. Among his works is one on the "Generation of Anatomic Elements." It is quite probable that his training as a physician influenced his political career. We quote from an article in the *Nineteenth Century*, 1907:

> The materialist doctor in him does not shrink from the ridicule one incurs by talking about a "total view of the universe," but the idealist appears at every moment in the social reformer.

Public Instruction in Cooking.—The Ministry of Food of Great Britain, and the London County Council, have provided facilities for instruction in cookery. According to *Commerce Reports* a number of schools have been established for teaching how to cook war foodstuffs, where persons may take the course without cost. The London County Council has a number of traveling kitchens equipped on motor cars which travel about London giving demonstrations on such subjects as: voluntary rations; food that serves the same purpose as meat; how to get the best value for money; substitutes for wheat flour; use of oatmeal, barley flour, maize meal and other cereals; economical use of sugar, aids and substitutes; catering for a week; unwise purchasing; the evils of underfeeding; the relation of price to value; kitchen economies; the fireless cooker, the "hot water jacket" and similar apparatus, and other devices for the saving of fuel. Courses in domestic economy have been provided in both the day schools and evening institutes. Children are required to attend these schools between the ages of 5 and 14 years. The course in domestic science is taken during the last two years of their attendance. Pupils devote one-half day each week to this subject. In some districts pupils devote half of the week for three to six months to these courses. The materials prepared in the cookery schools are sold to the children and teachers at about 90 per cent. of their cost. In January, 1917, there were 178 cookery centers, 56 laundry centers, 128 combined cookery and laundry centers, and 72 housewifery centers, providing for about 65,500 children. In addition to this there are evening instructions in war time meals, and advanced courses in domestic science offered by the polytechnic institutes.

Medical Mobilization and the War

MEDICAL OFFICERS NEEDED BY NAVY

Surgeon-General Braisted of the United States Navy announces that the Navy has not yet reached its maximum in needs for commissioned medical personnel, and that it is still welcoming offers of service for such duty. THE JOURNAL will be glad to send to physicians who are interested in this service a circular of information, and application blanks.

RED CROSS ACTIVITIES IN ITALY

Temporary organization of Red Cross agencies in Italy to meet the present emergencies has been perfected. Carl Taylor has been installed as general manager in Rome, and Edward Ayre Hunt has been placed at the head of the civilian relief department.——Ambulance companies and other personnel have been transferred to Italy from France. Money has been appropriated for buildings in Genoa for receiving refugees, and the king has turned over his royal villa at Monzo, to refugees from the invaded regions of Italy.

ANTITUBERCULOSIS WORK IN FRANCE

The mission headed by Dr. Livingstone Farrand sent to France by the Rockefeller Foundation to combat the threatened increase of tuberculosis in that country will organize its work into three sections. It is planned to establish in one of the arrondissements in Paris and in certain large provincial towns organizations consisting of dispensaries, clinics and laboratories and provision for domicillary attendance. This work will be under the direction of Dr. Miller. A second section under Dr. Charles White will undertake the distribution of assistance, and a third section under Professor Gunn will deal with publicity. This section has already begun its work in the organization of traveling exhibitions, meetings, kinematograph displays, etc.

REGULATIONS UNDER SELECTIVE SERVICE LAW

Section 151 B of the new selective service regulations concerns especially medical students and hospital interns registered under the law. It becomes effective December 15.

"Except in the following cases, no registrant may enlist voluntarily in the military or naval service of the United States.

"Under such regulations as the Surgeon-General may prescribe and on receiving permission from the Surgeon-General to do so, any medical student, hospital intern, dentist, dental student, veterinarian, or veterinary student may enlist in the enlisted reserve corps of the Medical Department, and thereafter on presentation by the registrant to his Local Board of a certificate of a Commissioned Officer of the Medical Department of the Army that he has been so enlisted, such certificate shall be filed with the Questionaire and the registrant shall be placed in Class V on the ground that he is in the military service of the United States. There is no other ground on which such persons (as such) may be placed in a deferred classification."

The effect of classification in Class V is to exempt or discharge from the draft. Regulations to carry out these paragraphs will be issued by the Surgeon-General. The effect of the new regulations will be to extend to first year medical students, after Dec. 15, 1917, essentially the same privileges in respect to Army service as are now enjoyed by students of the second, third and fourth year classes. The approval of the Surgeon-General will be granted to such students in well recognized medical schools only.

Since, under existing conditions, it is extremely unlikely that further calls for the present draft will be made before December 15, the fear expressed by first year medical students that they may not be able to continue their medical course is unwarranted, if they have not already been cited for the draft by their local board. In that case, the Medical Department has no authority.

NEWS OF THE BASE HOSPITALS

Base Hospital No. 30 Mobilized

Base Hospital No. 30, organized in the University of California Medical School, has been ordered to mobilize for the training of the enlisted personnel at Fort Mason, San Francisco. For this purpose it has been placed under the command of Col. Elmer A. Dean. Most of the officers of the organization have already had military training, and at present are in active service in various parts of the country. Those ordered for immediate mobilization with the unit are: Major Eugene S. Kilgore, director and chief of medicine; Capts. Jule B. Frankenheimer, Louis P. Howe and Arthur L. Fisher, and Lieuts. Malcolm Goddard, Hiram E. Miller and John M. Rehfisch.

The remainder of the official personnel are to be assembled when the organization is ready for foreign service. These include: Drs. Elbridge J. Best, Ernest H. Falconer, Arthur C. Gibson, C. R. Giles, Charles M. Richards, Howard E. Ruggles, Hudson Smythe, Charles L. Tranter, Herbert S. Thomson, William W. Washburn, Alanson Weeks, Nathan P. Wood, J. Homer Woolsey and Harold W. Wright.

NEWS OF THE TRAINING CAMPS

Fort Riley

The closing of the training camp at Fort Benjamin Harrison has brought a number of new men to Fort Riley. Lieut.-Col. William H. Tefft comes to take command of Evacuation Hospital No. 7, to which Major Don C. Peters from Camp Sheridan, Ala., has also been assigned. Major S. J. Turnbull from Fort Benjamin Harrison is in command of Hospital Train No. 24. Lieuts. D. C. Sherman, Albert V. Braden and G. L. Longworthy from Fort Benjamin Harrison are assigned to Evacuation Hospital No. 7; also Lieut. S. D. Bevill, who comes from Camp MacArthur, at Waco, Texas. Major Maurice H. Krebs has reported from Fort Benjamin Harrison as an instructor. Two motor driven evacuation ambulance companies have been organized to which have been assigned Capt. Harmon H. Ashley and Lieuts. George J. Culver, Theodore M. Wiersen and Frederick H. Spencer, all from Fort Benjamin Harrison.

QUARANTINE AT CAMP FUNSTON

Dry weather still continues. Practically no rain has fallen since October 25. Heavy fogs every morning keep the dust down, but the days are clear and warm. Efforts to control dust-borne diseases, especially pneumonia and meningitis, have resulted in quarantining Camp Funston. All student officers and instructors at the medical officers' training camp have been forbidden to enter Camp Funston except on official business. At the same time, all officers and men at Camp Funston has been forbidden to use the street cars, or to attend moving picure shows, theaters, or dances at Junction City, Manhattan or Army City. An isolation camp has been established outside Camp Funston, in which have been placed all contacts, suspects and carriers. Active measures are being carried on for the sterilization of carriers, the prophylactic treatment of contacts and the improvement of hygienic conditions. Overcrowding in company barracks has been greatly reduced, and adequate ventilation is being enforced. As a result, meningitis is markedly diminishing in Camp Funston, and last week's report showed simultaneous falling off in pneumonia. So far, Fort Riley has escaped any meningitis invasion, and the number of cases of pneumonia have been small.

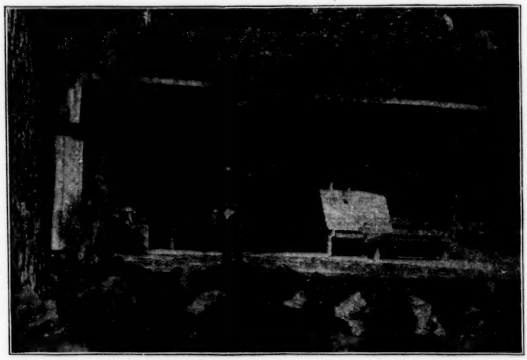
THANKSGIVING WEEK

But the real event of the week has been Thanksgiving. For the first time in years in most cases, and for the first time in their lives in some cases, medical officers spent Thanksgiving away from their families. Leave for seven days was given to half of the instructors, and to all student officers whose work was completed. Furloughs were given to 10 per cent. of the enlisted men. Many spent the day in Kansas City, Topeka and other nearby cities. But the majority of the men remained in camp. All classes were off, and all unnecessary work was discontinued. The Sunday and holiday routine was followed. True to American traditions, the principal function of the day was the Thanksgiving dinner. In each mess hall at 12 a bounteous meal was served, consisting of soup, roast turkey with oyster stuffing, mashed potatoes and gravy, celery and olives, green peas, tomatoes and other vegetables, mince and pumpkin pies, ice cream and coffee. The turkeys were a prime lot which had been brought to the reservation alive and fattened for several weeks. The mince pie was the real New England variety, and contained some ingredients that never were made in Kansas. In fact, one enthusiastic and well fed officer was heard to declare after dinner that his piece of pie was the first real drink he had had since he left home.

Sanitary Instruction at Fort Riley

In the past four months a project has been developed at the medical officers' training camp which we believe in many ways is unique in this country. This is a field sanitary laboratory (1) to train medical officers in the use and construc-

tion of the various types of sanitary apparatus which they might be required to construct in the field, and (2) to make a study of the different types of apparatus in current use, with a view to their betterment or the development of new and more efficient types. The laboratory is outdoors, occupying a considerable area of ground. A reserve corps medical officer in charge of an evacuation hospital may be called on to decide what he will do with the excreta, human and animal, of his organization. He may decide to burn it, as one solution of the problem. With no sewers, and no stream to help him out, he must dispose of the solid and liquid excreta of the thousand or more patients and soldiers for whose health he is directly responsible. The incineration of human excreta, especially when highly infective, requires special apparatus which must be constructed out of any materials available; that is, must be really "home-made," and yet must be perfectly efficient. After the regular course of lectures in hygiene and sanitation, the students are taken over in small groups to the laboratory and shown many of the approved types of apparatus for this purpose. These are carefully explained, often shown in operation, the relative merits of the different types elucidated, and the conditions under which one might be available, and another not available, thoroughly gone into. The question of manure may be be taken up. How is it to be disposed of and how is fly breeding to be prevented while it is being disposed of? The various methods of doing this are shown, and the apparatus, necessarily large and cumbersome, and the essential points of construction are explained. All of these have been made by the enlisted men, under the guidance of the director and his associates, and with no skilled mechanics to help. A large Panama railroad iron incinerator for manure was built. This involved the use of old rails, and something over ten tons were required. The Union Pacific lent some old rails, which had to be dragged by mules for several miles. These were drilled on the ground, U-bolts were made out of bar iron by the blacksmith of an ambulance company in his portable forge, nuts made from flattened horseshoes cut into squares were punched and threaded, and the whole was put up on six piers made from stone collected from the adjacent hill. This sort of work can be learned only by seeing the actual thing itself. Moreover, each class is now required to make drawings and actual plans of these pieces of apparatus, and a wholesome rivalry has grown up among the officers. Lately one can see a dozen or two officers with their camp stools perched in front of a field oven, a special latrine, an incinerator or what not, drawing away for dear life.



A lecture at the Medical Officers' Training Camp, Camp Greenleaf, Fort Oglethorpe, Ga. Major James B. Griffin, M. R. C., lecturing.

About forty pieces of apparatus have been constructed, and a considerable number are now on the road to completion. For the winter a large 50 foot tent has been set up on a frame and boarded in. Part of the work will be carried on there in inclement weather. At present a large apparatus for delousing clothing is nearly finished, and especial attention is being turned to the means of combating vermin in general.

The second purpose of the laboratory has been investigation, so far as this is possible with the facilities at hand. This has, however, already borne fruit in that a new incinerator, especially adapted to the needs of such organizations as a field hospital or evacuation hospital when immobile, has been devised, and has been put into successful operation. It is hoped it will develop into a standard type, especially since the waste heat is utilized, which means a great saving in fuel, which is so important under present service conditions. One other departure in the form of a portable latrine has been developed here, and many small improvements on existing apparatus. The exhibit was commented on favorably by the English and French commission when at Riley, and during the past week the commanding officer, Lieutenant-Colonel Bispham, has received instructions from Washington to have blueprints made of all exhibits and expedited to the Surgeon-General's Office. This will have been completed by the time this reaches our readers. The work will be carried on through the winter months and into new lines.

The director, Major Charles Spencer Williamson, M. R. C., and his associates, Capt. J. G. Shewbrooke, M. R. C.; Lieut. William E. Pretts, M. R. C., and Lieut. David Schmalhorst, M. R. C., are endeavoring to make the scope of the laboratory entirely practical, but governed by the same aims as any civil laboratory. At present, two modifications of a certain standard device are being tested, side by side, in respect to fuel consumption and rapidity of operation, so that when one type is recommended it will be on the basis of actual comparative experimental evidence.

The activities of the laboratory are quite diverse. Methods and apparatus for disposal of garbage, for delousing clothing, for disposal of manure, for prevention of fly breeding, for incineration of solid excreta, for disposal of sullage water, for destruction of flies, for preservation of food in the field, and for improvisation of field cooking apparatus are some of the subjects receiving attention.

NEWS OF THE CANTONMENTS

Thirty-First Division, Camp Wheeler, Macon, Ga.

Assistant Surgeon-General Rucker, U. S. P. H. S., visited the camp last week, while inspecting the work of the service in Macon and the area about the camp. The Public Health Service has been of great assistance by cleaning up the surrounding country, and especially by putting the dairies, ice cream factories, restaurants, etc., in a sanitary condition.

MEASLES

Our measles epidemic will soon be a thing of the past. The maximum number of cases was 1,201, and the greatest number of admissions in one day was 175. The epidemic began, October 22, was at its height, November 14, and was practically over by December 1. Of approximately 10,000 new men who came into the camp, 3,000 developed measles. It appears that the nonimmune in the draft men amounted to 30 per cent. of the whole. We are all glad now that the thing is over, instead of having it drag along for months, while we are on the way and in an inclement winter climate.

PNEUMONIA

The greater part of the pneumonia has been found among the new draft men, not in the old guardsmen. Major Zinser, M. R. C., has arrived from the Surgeon-General's Office to make a thorough epidemiologic study of pneumonia. Colonel Duncan asked this of the Surgeon-General when he was here. Both General Gorgas and Professor Welch thought it necessary and promised the help of the Surgeon-General's Office and the Rockefeller Institute in the study of pneumonia to its final analysis. Pneumonia stands in the same relation to the camp of 1917 that typhoid did to the camp of 1898. The origin and transmission must be elucidated as the origin and transmission of yellow fever, typhoid, meningitis and other epidemic diseases have been elucidated.

The whole division is now supplied with overcoats. This will surely reduce the amount of bronchitis, grip and pneumonia.

FOOD CONSERVATION

Captain Eddy, M. R. C., and three assistants are at work in the camp studying the conservation of food. It is to be

noted that they will reduce the amount of waste, whether or not the ration can be safely reduced.

BASE HOSPITAL NOTES

Major Halsey arrived Saturday, November 24, to take charge of the medical service. Major Hans Zinsser is now chief of the laboratory staff. Major Black of the Surgeon-General's Office spent two days at the hospital and gave a very interesting and instructive talk. The staff has been augmented by the arrival of sixteen new officers, twelve of whom are quartered in framed pyramidal tents. The nursing corps was increased by the arrival of a "carload" Wednesday morning. Lieutenant Cook has returned from New Orleans after taking a special course in fracture surgery. There are at present under treatment in the hospital 991 patients.

ONE HUNDRED AND SIXTH SANITARY TRAIN

The ambulance service of the camp has received many compliments on the efficient service rendered. Ambulance Company No. 121, commanded by Capt. Robert Ashworth, Alabama, has been permanently detailed on this service with good results.

We are much pleased at the low sick rate we have been able to maintain in the train, having consistently maintained the lowest rate of any unit in the division, despite the fact that during the recent epidemic of measles our men worked longer hours and were subjected to more general exposure than those of other units. Lieutenant Plante of the British Army lectured to the medical officers' class recently and gave many valuable tips and suggestions which we hope will prove helpful when we reach the trenches. Captain Crupper, Infantry, British Army, will talk to the medical officers' class on medical organization as carried on on the western front.

Thirty-Fifth Division, Camp Doniphan, Fort Sill, Okla.

SANITARY POLICE

The most important development of the past week was the establishing of a sanitary police, under control of the division surgeon, for the city of Lawton. For some time there has been a growing feeling that the insanitary conditions in the city of Lawton would sooner or later mean trouble both for that community and for the soldiers that go to Lawton. The facilities of Lawton to meet the wants of the military population of Camp Doniphan, more than twice the population of the city of Lawton itself, were obviously inadequate. The ambitious vender who would sell "red hots" and soft drinks to soldiers that were eager to get a variation from the regular camp mess did a flourishing business, in which the exchange of his wares for the good cash of the soldiers was the primary consideration, rather than the care and cleanliness with which the food was prepared.

The important work of regulating and controlling the situation has been detailed to Major W. S. Lawrence, M. C., N. G., who has been made assistant health commissioner for the city of Lawton. Under his immediate supervision, there has been established a first-aid station where venereal prophylaxis is given. There has been established also a municipal isolation hospital where the city's cases of contagious diseases will hereafter be treated. Aside from the military police, Major Lawrence will have the assistance of two experienced sanitary inspectors furnished by the state board of health.

Possibly for the first time in their existence the hotels and restaurants of Lawton have been asked to clean up and maintain cleanliness in their kitchens. Since the order to clean up will be controlled by the stationing of military police at the door of the establishment that fails to comply with the order, there can be no doubt that the orders will be promptly complied with. Drs. Duke and Sapper of the state health office have been in conference with Major Lawrence, the city officials and leading business men of Lawton, and the combined efforts of these men, no doubt, will succeed in providing for Lawton the long needed sanitary improvement.

DISEASE INCIDENCE

There were but two deaths to record for the past week, one from meningitis and one from pneumonia, the latter following a case of typhoid fever. The latter case is of interest in that the patient had received his last immunization against typhoid and paratyphoid one week before the development of his illness. All together, the health of the camp is very good, the morbidity rate, inclusive of injuries, being just a fraction above 3 per cent.

CARDIOVASCULAR EXAMINATIONS

Capt. Ralph C. Brown, M. R. C., has completed his work on cardiovascular conditions; a total of 487 cases were examined by him. Of these men, 354 were accepted and sixty-seven rejected; sixty-six were conditionally accepted for special service and will be transferred to the base hospital, where they will be under further careful observation and where tracings will be made to determine more fully their condition. Captain Brown reports that the majority of rejected patients showed mitral stenosis. This is rather interesting, since most of these men had been subjected to physical examination two or three times before they were brought before the cardiovascular board. Among other interesting findings of this board are a case of transposition of the viscera, and one of traumatic aneurysm of the carotid artery, following injury to this vessel from a stab wound.

PERSONAL NOTES

Capt. Ralph C. Brown, M. R. C., of the cardiovascular board, returns to Chicago, going temporarily on the inactive list until Base Hospital No. 13, of which he is a member, is ordered out.

Lieut. J. W. Follin, sanitary engineer, has been added to the staff of the division surgeon.

Seventy-Seventh Division, Camp Upton, Yaphank, N. Y.

During the past three weeks many promotions have been announced in the medical personnel of this division. In the new base hospital the services have now been well organized, and in many instances specialists of international reputation have taken charge of their respective special departments.

DISEASE INCIDENCE

We have thus far been singularly fortunate with our pneumonia patients. They have not been numerous, and there have been no deaths, a result which appears to be largely due to the early employment of the Cole serum. Most of our cases seem to be of the Type I infection, which is fully recognized to respond most satisfactorily to this method of treatment. Highly mixed infections have not been frequent, doubtless also accounting largely for our good fortune thus far.

The death of Major Richard Weil, who was intimately known to many of the workers at this cantonment, has been much regretted by all members of our staff.

Our good fortune in regard to the contagious diseases has been thought to be largely due to the fact that we have thus far drawn our recruits chiefly from a dense urban population in which, naturally, the susceptible material has passed through these standard infections in large part before coming to the cantonment. It is difficult otherwise to account for our very small percentage of measles, mumps and diphtheria. Only a single case of the last mentioned contagion has appeared at the base hospital, and our few sporadic cases of mumps have thus far shown nothing of an epidemic character. In the past the same statement was true also of measles, which has been such a serious factor in some camps, particularly in those drawing their material from a largely rural population. The recent assignment of colored troops from the South to Camp Upton bears out in a very striking way this assumption. Among the colored troops from New York City and its environs, now numbering several thousand, not a single case of measles or mumps has developed; but in a small battalion of those from the South, ten cases of measles and two of mumps appeared within the first week. Rigid quarantine measures have been enforced, however, and it is hoped that in this way we may at least prevent the spread of these diseases to other troops.

PSYCHOLOGIC TESTS

An interesting side light on the question of the alleged conscientious objector has been developed by the findings of a psychiatric board composed of Major Hammond, Captain Rosanoff and Lieutenant Pearse. Excluding those who for natural, national and entirely honorable reasons desire to evade service in our Army, this board found that nearly 90 per cent. existed in instances of clear mental disease or degenerates. It is regrettable that public examinations of this character of the nonmilitary population cannot be conducted, and that the defectives of this type outside as well as within the Army should be confined in asylums or similar public institutions.

MENINGITIS

A single and early fatal case of epidemic cerebrospinal meningitis has appeared in the camp. Apparently the case

originated from an extramural infection, and thorough examination of all contacts has disclosed no carriers as yet.

ANTHRAX

A somewhat unusual case of anthrax was discovered in which the clinical diagnosis was that of a septic meningitis, possibly epidemic. Lumbar puncture showed the cerebrospinal fluid to be turbid with a growth of anthrax bacilli. Postmortem examination showed the infection to have probably been of intestinal origin, although one skin lesion suggested the possibility of inoculation through this avenue. This also seems to have been acquired outside the encampment.

NOTES

The weekly meetings of the Upton Medical Society have been largely attended, and the programs have been of a very high and instructive character. Major E. K. Dunham gave us a most interesting illustrated talk on the newer methods of antisepsis. Major Thomas Darlington discussed fatigue. Lieutenant Pelitier of the Medical Corps of the French army gave a most interesting lecture, illustrated by lantern slides of the Carell-Dakin method of treatment of surgical injuries and wounds. Dr. Haven Emerson, commissioner of health for New York, discussed the subject of tuberculosis, chiefly from a statistical standpoint and concerning its methods of propagation, especially as applied to such compact communities as the military camp. Next week the medical society is to be addressed by W. H. Park, director of the Research Laboratories of the New York Board of Health.

Among the distinguished medical visitors of the camp have been Rufus Cole, Alfred Kohn and A. R. Dochez from the Rockefeller Institute.

Eighty-Fourth Division, Camp Zachary Taylor, Louisville, Ky.

Orders have been received regarding equipment and baggage that may be taken by troops designated for duty with expeditionary forces in Europe. Each officer below the grade of major, and each contract surgeon, acting dental surgeon and acting veterinarian may have baggage not to exceed 250 pounds. This allowance includes Equipment C, professional books and all necessary clothing and bedding for extended field service. Containers for personal baggage for the above named officers shall be the standard trunk locker and bedding roll or similar containers of their approximate equivalent volume. Mosquito bars, head nets and khaki clothing will not be taken.

PSYCHOLOGIC TESTS

More than 10,000 men have been given the intelligence tests by the psychologic board that is now sitting at Camp Zachary Taylor. The board is headed by Lieut. Marion R. Trabue, chief examiner, formerly engaged in psychologic work at Columbia University. Other members are Lieut. Clarence S. Yoakum, University of Texas; Lieut. Heber S. Cummings, Kansas Agricultural College; Lieut. Edgar A. Doll, Cornell University; Dr. Eugene C. Rowe, Michigan Normal School; Dr. James W. Bridges, Ohio University; Calvin P. Stone, Jeffersonville Reformatory, and John K. Norton and J. David Houser of Leland Stanford Junior University.

The men are graded after examination by scores ranging from zero to 414, and are arranged into five grades, from A to E. For a man to make Grade A, his score must be between 300 and 414. This is known as the very superior grade, and the Grade A men are characterized as being skilled in abstract thinking. Grade B ranges between 250 and 299. This is the superior grade, and the one usually made by the typical officer. Grade C is the "average" grade, ranging from 100 to 249. This grade is usually made by the typical private. Grade D consists of the unskilled laborer class, is called "Inferior," and is from 50 to 99. The lowest is E, with scores ranging from zero to 49. These men are classed as "very inferior," and are dull, ineffective or feebleminded or nearly so. The majority of men of this class are recommended for discharge on account of deficient mentality.

The examinations are conducted in an unoccupied ward of the base hospital, an entire company being put through at one time. The examination is made out on a printed pamphlet consisting of about twenty pages. Each man is given a pamphlet and pencil, and is told what to do in each test by an instructor. The man must put a cross in the largest of a row of squares printed across the sheet, all different sizes, but nearly the same. He must at a glance underline the highest and lowest row of figures; take dictation of numbers and sentences, etc. The illiterates and others who fail at the written examination are given individual examinations to show their mechanical sense and skill. They are given bells and locks in pieces to be put together. If they do not show any mechanical skill, they are given the various tests used at institutions for the feebleminded and at emigrant stations. Failing these simple tests, the man is rated as being deficient in mentality and is discharged. In one group of 300 examined, the board found ten imbeciles. One private made the highest grade recorded, 409 out of a possible 414. All officers will be examined, and are expected to make 250 or over.

At Camp Lee, where the medical officers were examined, several were found to have made only "average" grades. The medical officer in command found on investigation that the men who had made the low marks had consistently bungled up paper work. They were watched more closely, and if they did not show any sign of improvement, they were discharged. At this camp the officers in the Engineering Corps ranked highest in the intelligence tests, followed by infantry, quartermaster and medical officers last.

Contrary to general belief, no amount of study seems to improve the men's grade. If given the same test two years from now, they would make practically the same grades, and they are believed to show completely the capability of the brain.

This rating of the men will be of great advantage to the officers. The quick thinkers can be chosen for important pieces of work. While some man may have a high grade from an intelligence test, he may not make a good soldier, as he may be both physically and morally wrong. The results are carefully checked over, and a form is made out with a complete list of names of each company with a man's grade opposite his name. A regimental list is also made out for the division commander. The board will probably complete its work by January 1, when it will probably be ordered to another camp.

It is believed here that the results of the intelligence tests will influence the selection of candidates for the next officers' training camp.

MEASLES

Measles has spread to nearly every company of the Three Hundred and Thirty-Fifth Infantry, composed mostly of men from southern Indiana, all but two companies being quarantined. Most of the patients have been taken to the base hospital, while the men with milder cases are kept in the regimental hospital.

Two Y. M. C. A. secretaries have gone into voluntary quarantine in order to serve the men in the two quarantined regiments.

BASE HOSPITAL

There are now 681 patients in the base hospital, sixty-three with wounds and injuries. With venereal diseases there are now on duty 363 gonorrhea patients, twenty-three syphilis, and nineteen chancroid patients. New measles cases, twenty-two in all, were reported during the week from eight different organizations. The total percentage of sick was 3.74 or, omitting "wounds and injuries," 3.31. The division comprises 24,716 men at present, with 1,034 reported sick. The total number received to date has been 27,000, and 2,017 have been discharged by the reviewing board. The tuberculosis board has been actively at work, examining each officer and drafted man. Pulmonary tuberculosis has caused a large proportion of the rejections, several of those rejected being officers. Trachoma has also caused a large number of rejections, most of these patients being from eastern Kentucky counties. Few patients with primary syphilis are being rejected, these being now treated at the camp. Men with tertiary cases are rejected.

Eighty-Fifth Division, Camp Custer, Battle Creek, Mich.

The most interesting event of the past week was the visit of Colonel Chamberlain of the Surgeon-General's Office. He made a complete inspection of all departments of the sanitary troops.

Major Edwards, the new sanitary inspector, is rapidly developing the plans of sanitation necesary for the well-being of the camp. He is particularly anxious to obtain the proper air space, floor space and head space in the various barracks so that the men in their sleeping quarters will have the proper ventilation. The fact that there is a minimum amount of pneumonia in the division speaks for the results of this plan of ventilation.

THREE HUNDRED AND TENTH SANITARY TRAIN

There is much of interest in the activities of the sanitary train. Football, basketball, orchestra, minstrel shows all make the long evenings pleasant for the men.

The field hospitals and ambulance companies are working in conjunction with each other in their plan of training. The ambulance companies are setting up dressing stations and are operating between the trenches and the field hospital which is set up a mile or two from the dressing station ready for action in every particular, each department fully equipped and ready for work.

The night time is being utilized for the purpose of training. It is understood that the wounded are transported at night. Major Jackson, director of ambulance companies, has worked out an original idea of training ambulance drivers to drive at night without lights. He works out his scheme by having the eyes of the drivers covered so that they cannot see, and then instructs them in feeling their way along the road. The major figures that they can learn conditions of the road and locations much in the same manner as the blind utilize their other senses in determining location. The men of the various companies are enjoying this night work tremendously, and are becoming proficient in doing all the work, such as tent pitching and striking and road work, as well as they do by daylight. One of the most difficult problems to teach men is definite location at night without the use of a compass. They are taught to work out directions so that becoming lost or walking around in a circle is practically impossible.

Eighty-Seventh Division, Camp Pike, Little Rock, Ark.

Camp Pike is receiving rapidly its quota of troops from the northern cantonments. These men are as a class robust, ruddy-cheeked, and physically fit. There is little evidence of an undernourished condition or of hookworm and anemia, a state of affairs widely prevalent among the men first received at this place.

The time-honored custom of "passing the buck" has not been entirely eliminated in this connection, a certain percentage of these northerners being in a physical condition warranting their discharge rather than their transfer to Camp Pike. Some of these drafted men who intentionally or through accident just prior to draft became unfit were sent on anyway and have been crippling about the camps for some time. These men are unfit for drill, and unless they can do office work, cannot be trained to any extent. A recent order from the War Department has been issued expressly for the purpose of stopping this practice. It is to the effect that whenever a county or parish sends up a man who proves to be unfit for military service, the man shall be returned to the board sending him and the board required to send up another man who is fit. A special board of examiners is now on duty at the base hospital for the purpose of expediting the return of these men to their respective boards. Lieut. John Thorpe, Chicago, who is at present attached to the Three Hundred and Twelfth Sanitary Train, is assisting the division surgeon in this work.

BASE HOSPITAL AT FORT LOGAN H. ROOTS

Fort Logan H. Roots, which is about 3 miles distant from Camp Pike, has been designated as the site of a base hospital of 500 beds, to supplement the base hospital at Camp Pike. Lieut.-Col. George F. Jueneman of the Medical Corps is to be in command. In order to build at Fort Roots a hospital of this size, it will be necessary to utilize the brick barracks at this post. The post hospital at Fort Roots was used as a base hospital for Camp Pike during the early days of the construction work at the camp. The location is ideal, Fort Roots being situated on a high bluff overlooking the Arkansas River.

Lieut. E. J. Wentworth, of the orthopedic staff at the base hospital, concluded his course of lyceum lectures with two lectures on the spine. Lieutenant Wentworth spent some time emphasizing the fact that medical officers should strive always to assume the "posture of a soldier." He said the criticism had often been made by line officers that too many of the medical officers did not "look or act like soldiers." Lieutenant Wentworth's lecture were followed by one by Major McKenna of the base hospital, formerly of Chicago, on surgery of the bones and joints. The lecture was illustrated with fifty-two lantern slides which showed what might be accomplished in the work on the joint cavities. One of the most interesting and entertaining lectures given at the lyceum course recently was one by Major Amos Gale Straw of Boston, who is in charge of the roentgen-ray department in the base hospital at Camp Pike. This lecture was general in character, and dealt with Major Straw's nine months' experience in an evacuation hospital in France. One of the major's amusing experiences was that of being continually mistaken in England for the noted movie actor, the late John Bunnie.

The following assignments of commanding officers have been made in the sanitary train: Major R. H. Davies, director of field hospitals and assistant adjutant of the Three Hundred and Twelfth Sanitary Train; Capt. Paul R. Howard, director of Field Hospital No. 345; Lieut. Charles D. Mason, director of Field Hospital No. 346; Capt. William Carstophen, director of Field Hospital No. 347, and Capt. James Slack, director of Field Hospital No. 348. In the ambulance companies, Capt. Nolan Stewart is in command of No. 345; Capt. John B. Steele of No. 346; Lieut. Charles Lerrigo of No. 347, and Capt. Thomas McCabe of No. 348. The first three field hospitals and the first three ambulance companies are motor drawn; the fourth field hospital and the fourth ambulance company are animal drawn.

HEALTH OF THE CAMP

Health conditions at Camp Pike are in the main very good. There has been some cerebrospinal meningitis lately, the focus of infection apparently being some troops brought from a northern cantonment.

Eighty-Ninth Division, Camp Funston, Fort Riley, Kan.

ISOLATION CAMP

An isolation camp has been instituted at Camp Funston for all men who have been in contact with patients that have developed contagious or infectious diseases here. The camp is located on the Pawnee flats of the Fort Riley Reservation, and consists of tents with wooden floors and sides. The training of the isolated men, none of whom are actually sick, will proceed just the same as though they were with their organizations, as far as this is practicable. Provisional companies are being formed from men belonging to the same regiments or organizations, and these men drill as units, being carefully watched for any symptoms of disease that might develop. The colored troops have a separate portion of the camp from the white troops. The camp is under the supervision of Lieut.-Col. Frank Weed, and is officered by members of the One Hundred and Sixty-Fourth Depot Brigade. The cooks and kitchen police are also from the depot brigade, none of the "contacts" being allowed in the kitchens. Food is cooked here and carried by the men of the different groups to their tents to be eaten.

Mumps contacts, measles, meningitis carriers, meningitis contacts, tonsillitis, diphtheria, scarlet fever, and epidemic conjunctivitis contacts are all in separate groups and are not allowed to intermingle.

When the actual contacts can be ascertained, this arrangement will prevent whole companies from being quarantined, which has been the necessary and established procedure until this time.

SEARCH FOR CARRIERS

As an additional sanitary measure, cultures are being made from the throats of all men in the search for carriers. Enough men have been removed from all barracks where there are not 500 cubic feet of air per man to give the correct allowance. Beds are so arranged that the foot of one bed is opposite the head of the bed at the side of it, thus aiding in preventing droplet infection from sneezing or coughing at night. Beds must be at least 18 inches apart. An officer also inspects each barracks at midnight to see that a sufficient number of windows are opened.

DISEASE INCIDENCE

All of the diseases of the camp show a declining incidence, with the exception of measles, mumps and pneumonia. I am not permitted to give official figures.

HEALTH OF EXTRA CANTONMENT ZONE

The nearby towns of Junction City and Manhattan have become somewhat alarmed over the situation, as the result of rumors that have been fallaciously spread which are probably distorted accounts about the necessity of our sanitary precautions. They talked about quarantining soldiers from these towns, but finally reconsidered. All soldiers of the cantonment have already been prohibited by order from going to movies, attending church socials, or in any way congregating into large groups, among which may be carriers. Two cases of meningitis have developed in Manhattan and one in Junction City. As a precaution, the throats and noses of all workmen who live in these towns are being sprayed daily with dichloramin-T, the same treatment that is given the soldiers.

DISEASE CONDITIONS AMONG TROOPS IN THE UNITED STATES

Extracts from Telegraphic Reports Received in the Office of the Surgeon-General for the Week Ending Nov. 23, 1917

1. Total strength of Troops in United States as reported....1,067,698
   Annual admission rate per 1,000 (disease only)..... 1,619.8
   Non-effective rate (all divisions)..... 38.6
2. National Guard, strength (Divisions in United States) 403,573
   Annual admission rate per 1,000 all divisions (disease only) 1,732.9
   Non-effective rate all divisions (all causes) 44.5
   Divisions showing admission rate for disease higher than average: Camps Bowie, Wheeler, Beauregard, Kearney, Sevier, Cody, Doniphan and Shelby.
   Divisions showing non-effective rate all causes higher than average: Camps Bowie, Beauregard, Wheeler, Sevier, Kearney, Shelby, Cody and MacArthur.
3. National Army, strength (Divisions in United States).....426,310
   Admission rate per 1,000 all divisions (disease only).... 1,444.6
   Non-effective rate all divisions (all causes) 30.7
   Divisions showing admission rate for disease higher than average: Camps Travis, Jackson, Funston, Pike, Dodge, Dix and Lewis.
   Divisions showing non-effective rate all causes higher than average: Camps Pike, Funston, Jackson, Travis, Lewis and Dix.
4. Venereal Disease—
   Annual admission rate Regulars in United States..... 146.1
   Annual admission rate National Guard (Divisions in U. S.).. 68
   Annual admission rate National Army (Divisions of U. S.)... 69
   National Guard Division having rate above average: Camps Doniphan, Ewie, Logan, Beauregard and Wheeler.
   National Army Division having rate above average: Camps Jackson, Dix, Travis and Gordon.
5. Number of cases of pneumonia 616
   Highest number in any one division .....(31st Division) 150
   Number of cases of meningitis 77
   Highest number in any one division .....(89th Division) 20

6. NEW CASES OF SPECIAL DISEASES REPORTED DURING THE WEEK ENDING NOV. 23, 1917

Division	Pneumonia	Dysentery	Malaria	Venereal	Paratyphoid	Typhoid	Measles	Meningitis	Scarlet Fever	Strength of Command
27th, Wadsworth..	2	...	...	15	...	...	....	...	...	31,882
28th, Hancock....	3	...	...	13	...	...	....	...	...	28,739
29th, McClellan....	5	...	4	12	...	1	17	1	...	26,503
30th, Sevier.....	97	...	2	17	...	...	802	5	...	27,385
31st, Wheeler.....	150	2	15	31	...	...	496	3	...	22,759
32d, MacArthur..	1	...	...	11	...	...	93	...	3	26,661
33d, Logan.....	13	3	4	64	...	...	4	1	...	32,899
34th, Cody.....	7	...	1	14	...	...	226	...	...	25,673
35th, Doniphan....	19	...	...	171	...	...	66	4	7	25,601
36th, Bowie.....	36	...	...	56	...	...	1038	2	...	27,749
37th, Sheridan.....	4	...	1	16	...	...	31	1	1	24,104
38th, Shelby.....	14	2	4	33	...	...	454	3	...	29,268
39th, Beauregard..	68	...	10	20	...	...	738	4	...	19,987
40th, Kearney.....	5	...	2	13	...	...	95	5	1	24,549
41st, A. L. Mills...	9	...	...	22	...	...	72	...	4	28,811
76th, Devens.....	2	...	...	34	...	...	11	...	...	27,025
77th, Upton.....	2	...	...	11	...	...	....	1	...	25,444
78th, Dix.....	...	...	...	49	...	...	....	...	...	16,701
79th, Meade.....	4	...	...	10	...	...	14	...	...	33 301
80th, Lee.....	9	...	3	38	...	1	73	...	...	35,056
81st, Jackson.....	4	1	4	143	...	...	528	1	...	17,341
82d, Gordon.....	2	...	...	57	...	...	125	3	...	33,000
83d, Sherman.....	6	1	...	41	...	...	13	...	1	32,569
84th, Taylor.....	10	...	...	8	...	...	107	10	...	24 019
85th, Custer.....	1	...	...	9	...	...	41	...	...	20,773
86th, Grant.....	4	...	...	24	...	...	2	1	...	22,569
87th, Pike.....	51	1	...	12	...	...	201	6	20	22,273
88th, Dodge.....	12	1	...	22	...	...	17	...	5	21,917
89th, Funston.....	20	...	...	17	...	...	101	20	3	18,449
90th, Travis.....	26	1	10	70	...	1	....	...	...	20 902
91st, Lewis.....	8	...	...	21	...	...	33	4	1	35,167

7. ANNUAL RATE PER THOUSAND FOR SPECIAL DISEASES

	Regulars, U. S. Army, in U. S. only, 1916	Regulars in U. S., Week Ending Nov. 23, 1917	National Guard, All Camps, Week Ending Nov. 23, 1917	National Army, All Camps, Week Ending Nov. 23, 1917	American Expeditionary Forces, Week Ending Nov. 16, 1917
Pneumonia.....	2.59	9.1	55.7	19.6	7.2
Dysentery.....	3.97	0.8	0.9	0.6	0.0
Malaria.....	12.52	1.7	5.4	2.0	0.9
Venereal.....	91.00	165.1	68.0	69.0	81.1
Paratyphoid.....	0.31	0.0	0.0	0.0	0.0
Typhoid.....	0.21	0.9	0.4	0.2	0.0
Measles.....	26.29	51.7	533.6	167.2	31.5
Meningitis.....	0.29	1.1	3.7	5.6	0.0
Scarlet fever.....	0.30	1.1	2.1	3.6	1.3

ORDERS TO OFFICERS OF THE MEDICAL CORPS

Lieut.-Col. ROBERT H. PIERSON, relieved at Camp Travis, Fort Sam Houston, Tex., and *to Camp Logan*, for duty as Division Surgeon.

Major HENRY P. CARTER, relieved at Camp Lee, and *to Camp Logan*, Houston, Tex., for duty as Division Sanitary Inspector.

Lieut.-Col. ROBERT L. CARSWELL, relieved at Fort Sam Houston, Tex., and *to Camp Greene*, Charlotte, N. C., for duty as Division Surgeon.

Major ISAAC W. BREWER, relieved at Fort Ethan Allen, Vt., and *to Camp Greene*, Charlotte, N. C., for duty as Division Sanitary Inspector.

Lieut.-Col. WILLIAM R. EASTMAN, relieved at Fort Clark, Tex., and *to Camp Greene*, Charlotte, N. C., for duty as Division Surgeon.

Col. FRANK R. KEEFER, relieved at the Hawaiian Dept. and *to San Francisco, Calif.*, to report in person to the commanding general, Western Dept. for assignment to duty.

Lieut.-Col. HORACE D. BLOOMBERGH, relieved at the Hawaiian Dept. and *to San Francisco, Calif.*, to report in person to the commanding general, Western Dept., for assignment to duty.

Major FRANK W. WEED, relieved at Camp Funston, Fort Riley, Kansas, and *to Camp McClellan*, Anniston, Ala., for duty as division surgeon.

Major CHESTER R. HAIG, relieved at Camp Sheridan, Montgomery, Ala., and *to Hoboken, N. J.*, for duty with hospital to be organized at Hoffmans' Island.

Col. DEANE C. HOWARD, to the following-named camps for the purpose of inspection and on completion to his proper station, *Camp Funston*, Fort Riley, Kan.; *Camp Beauregard*, Alexandria, La.; *Camp Pike*, Little Rock, Ark.; *Camp Sevier*, Greenville, S. C.

Major EDGAR KING, *to Camp May, N. J.*, to inspect a hotel building under consideration for use as a hospital and on completion will return to his proper station.

Col. EDWARD R. SCHREINER, now on duty at the U. S. Army General Hospital, No. 1, Williamsbridge, N. Y., be assigned in addition to his other duties, as lecturer on military medicine and surgery at the Columbia University, New York City.

Col. HENRY C. FISHER, from Camp Wheeler, Macon, Ga. *to Camp Joseph E. Johnston*, Jacksonville, Fla., to inspect and recommend sites for a base hospital at that place.

Major SAMUEL S. CREIGHTON, *to Camp Logan*, Houston, Tex., for temporary duty in connection with instruction of the Medical Dept. and upon completion to return to his proper station.

Col. WILLIARD F. TRUBY, relieved at Leon Springs, Tex., and *to Fort Sam Houston*, Tex., for duty in the office of the Dept. Surgeon.

ORDERS TO OFFICERS OF THE MEDICAL RESERVE CORPS

Alabama

To Camp Beauregard, Alexandria, La., for duty, from Fort Oglethorpe, Lieut. JAMES H. PHILLIPS, Dora.

To Camp Dix, Wrightstown, N. J., base hospital, Lieut. GEORGE C. KILPATRICK, Mobile.

To Camp Greene, Charlotte, N. C., Third Division Headquarters Military Police, from Camp Greenleaf.

To Camp Wheeler, Macon, Ga., base hospital, from Camp Greenleaf, Lieuts. THOMAS K. LEWIS, JOHN D. SHERRILL, Birmingham.

To Fort Oglethorpe, Ga., for instruction, Lieut. CHARLIE H. CHAPMAN, Geneva.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. GROVER C. HAMILTON, Birmingham.

To Philadelphia, Pa., Evans Dental Institute, for instruction, from Newport News, Va., Capt. MACK ROGERS, Birmingham.

To Philippine Dept. for duty, from Camp Dix, Lieut. MANNIE A. FORT, Grand Bay.

To his home and the inactive list from Camp Wheeler, Lieut. ALBERT S. ZIMMERMANN, Larkinsville.

Arizona

To Fort Oglethorpe, Ga., for instruction, from Camp Cody, Lieut. ROGER V. PARLETT, Whiteriver.

Arkansas

To Camp Kearney, Linda Vista, Calif., base hospital, from Fort Oglethorpe, Lieut. JAMES W. RAMSEY, Jonesboro.

To Camp Shelby, Hattiesburg, Miss., base hospital, from Fort Riley, Lieut. FRED S. WATSON, Amity.

To Camp Sherman, Chillicothe, Ohio, base hospital, from Fort Benjamin Harrison, Capt. SCOTT C. RUNNELS, Little Rock.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieut. WYLIE R. FELTS, Judsoma.

California

To Camp Kearney, Linda Vista, Calif., base hospital, Capt. BYRON P. STOOKEY, Los Angeles; Lieut. HARRY E. FOSTER, Berkeley.

To Camp Lewis, American Lake, Wash., base hospital, Lieut. FREDERICK A. COLLER, Los Angeles.

To Camp Meade, Annapolis, Md., base hospital, from Post-Graduate Medical School, New York City, Lieut. THOMAS R. PETCH, Eureka.

To his home and honorably discharged from Camp Kearney, Lieut. CHARLES H. FREEMAN, Oakland.

To the inactive list, from Fort Oglethorpe, Lieut. ANDREW B. WESSELS, San Diego.

Canal Zone

To Fort Oglethorpe, for instruction, from Army Medical School, Lieut. WILLIAM B. FOSTER, Jr., Ancon.

To Walter Reed General Hospital, Takoma Park, D. C., for duty, from treatment at the Walter Reed General Hospital, Major WILLIAM A. DUNCAN, Ancon.

Colorado

To Camp Bowie, Fort Worth, Texas, base hospital, Capt. LEWIS B. McKINNIE, Colorado Springs.

Honorably discharged on account of being physically disqualified for active service, Lieut. LOUIS A. PACKARD, Denver.

Connecticut

To Army Medical School, Washington, D. C., for orthopedic instruction, from Camp Bartlett, Lieut. WILLIAM F. COLLINS, New Haven.

To Camp Funston, Fort Riley, Kan., Eighty-Ninth Division for duty, from Fort Benjamin Harrison, Lieut. EDWARD J. HOWLAND, Colchester.

To Camp Travis, Fort Sam Houston, Tex., for duty, from Fort Oglethorpe, Lieut. ARTHUR F. McDONALD, Waterbury.

To Camp Upton, L. I., N. Y., as member of board for examination of command for tuberculosis, from Walter Reed General Hospital, Lieut. RAYMOND V. QUINLAN, Meriden.

To Camp Wheeler, Macon, Ga., base hospital, from Fort Oglethorpe, Lieut. GEORGE H. DALTON, New Britain.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. SYDNEY V. KIBBY, Hartford.

To New Haven, Conn., for duty as a medical member of examining board and recruiting officer, Lieut. JAMES A. HONEIJ, New Haven.

To New York City, Neurological Institute, for intensive training in brain surgery, Capt. DANIEL C. PATTERSON, Bridgeport; from Psychopathic Hospital, Boston, Capt. OTTO G. WIEDMAN, Hartford.

To Philadelphia, Pa., Evans Dental Institute, for instruction, from Camp Greenleaf, Lieut. WATERMAN LYON, New Britain.

To Portland, Ore., for assignment to duty with aero squadrons from Fort Riley, Lieut. WILLIAM P. BALDWIN, New Haven.

To the inactive list, from Fort Oglethorpe, Lieut. GEORGE P. CHENEY, New London.

Delaware

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Oglethorpe, Lieut. BRUCE H. BEELER, Wilmington.

District of Columbia

To Army Medical School, Washington, D. C., for instruction in orthopedic work, Lieut. JOHN A. TALBOTT, Washington.

To New York City, for a course of instruction in urology, from Pittsburgh, Lieut. IVY A. PELZMAN, Washington.

To Washington, D. C., for duty in the Surgeon-General's Office, Capt. SCOTT D. BRECKINRIDGE, Washington.

Florida

To Camp Bowie, Fort Worth, Texas, for duty, from Fort Oglethorpe, Lieut. HARPER L. PROCTOR, Jacksonville.

To Camp Greene, Charlotte, N. C., Headquarters Military Police, from Camp Greenleaf, Lieut. SHORES E. CLINARD, Gretna.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. JOHN C. HOLLEY, Pace.

To report to the Commanding General, Southeastern Department, for assignment to duty, from Chickamauga Park, Ga., Lieut. T. Z. GASON, Jacksonville.

Georgia

To Atlanta, Ga., Aviation Section, Signal Corps, Emory University, for duty, Lieut. ERNEST S. COLVIN, Atlanta.

To Camp Greene, Charlotte, N. C., Headquarters Military Police, from Camp Greenleaf, Lieut. RUFUS T. GRAHAM, Stillmore.

To Camp Wheeler, Macon, Ga., Headquarters Military Police, from Fort Oglethorpe, Lieut. JAMES H. MacDUFFIE, Jr., Columbus.

To Fort Logan H. Roots, Ark., for temporary duty, from Camp Greenleaf, Lieut. BENJAMIN H. MINCHEW, Waycross.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Oglethorpe, Lieut. EARL K. LAZENBY, Camak.

To Rockefeller Institute, New York City, for instruction in pneumonia, and on completion to Camp Gordon, base hospital, Lieut. JAMES H. BUTLER, Augusta.

Idaho

To Camp Wheeler, Macon, Ga., Thirty-First Division, as member of board for examination of command for tuberculosis, from Camp Doniphan, Lieut. CLYDE E. WATSON, Nampa.

Illinois

To Ann Arbor, Psychopathic Hospital, for intensive training in his specialty, from Fort Benjamin Harrison, Lieut. CARL G. S. RYDIN, Chicago.

To Army Medical School, Washington, D. C., for instruction in orthopedic surgery, Lieut. CARROLL L. STOREY, Oberlin.

To Boston, for duty, from Camp Grant, Major THOMAS A. WOODRUFF, Chicago.

To Camp Custer, Battle Creek, Mich., Eighty-Fifth Division, for duty from Fort Benjamin Harrison, Capt. WILLIAM J. UPPENDAHL, Peoria.

To Camp Doniphan, Fort Sill, Okla., for duty, from Fort Oglethorpe, Lieut. DAVID R. SCOTT, Macomb.

To Camp Hancock, Augusta, Ga., Twenty-Eighth Division, for duty, from Fort Benjamin Harrison, Lieut. ALEXANDER A. DRILL, Chicago.

To Camp Gordon, Atlanta, Ga., base hospital, from Fort Benjamin Harrison, Lieut. GILBERT M. LOEWE, Chicago; as member of board for examination of command for tuberculosis, from Camp Sheridan, Montgomery, Ala., Lieut. JAMES A. BRITTON, Chicago; from Fort Benjamin Harrison, Lieut. OTTO J. SCHOTT, Chicago.

To Camp Greene, Charlotte, N. C., Headquarters Military Police, from Camp Greene, Capt. GEORGE A. KELSO, Chicago.

To Camp Logan, Houston, Texas, base hospital, Lieut. OLIVER C. HARGREAVES, Chicago.

To Camp Pike, Little Rock, Ark., for duty, from Fort Oglethorpe, Lieut. HERSCHEL V. BRUNKER, Casey.

To Camp Shelby, Hattiesburg, Miss., for duty, from Fort Oglethorpe, Lieut. MAURICE WILLIAMSON, Alton.

To Camp Sherman, Chillicothe, Ohio, base hospital, from Fort Benjamin Harrison, Lieut. ADOLPH M. TEIXLER, Chicago.

To Camp Upton, L. I., N. Y., base hospital, from Post-Graduate Medical School, New York City, Lieut. GEORGE E. O'GRADY, Chicago.

To Camp Wadsworth, Spartanburg, S. C., for duty, from Fort Benjamin Harrison, Capt. NATHAN S. DAVIS, Chicago.

To Camp Wheeler, Macon, Ga., base hospital, from Fort Benjamin Harrison, Lieuts. MAURICE W. BYRNE, Chicago; as member of tuberculosis examining board, from Fort Benjamin Harrison, Lieut. EDWARD BUCKMAN, Chicago; from Fort Sill, Lieut. EDWARD G. SEPPLE, Chicago.

To Fort Riley, Kan., for instruction, Lieuts. RAYMOND F. ELMER, Chicago; NORTON W. BOWMAN, Flora.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. PETER T. SPURCK, Peoria.

To Montgomery, Ala., for duty, from Fort Benjamin Harrison, Capt. CHARLES DUDLEY, Chicago.

To Pittsburgh, for instruction in military roentgenology, from Fort Oglethorpe, Lieut. ELMER M. SMITH, Georgetown.

To Portland, Maine, for duty, from Camp Greenleaf, Lieut. JAMES A. VALENTINE, Newman.

To Kelly Field, San Antonio, Texas, for duty, from Fort Benjamin Harrison, Lieut. WILLIAM E. MERCER, Liberty.

Honorably discharged, Lieut. MERLE H. WHITLOCK, Canton.

To his home and the inactive list, from Camp Taylor, Major FREDERICK MENGE, Chicago.

To his home and the inactive list, on account of being physically disqualified for active service, Lieut. AUSTIN I. BROWN, Murphysboro.

Indiana

To Anniston, Ala., base hospital, from Fort Benjamin Harrison, Lieut. JESSE L. STOWERS, Indianapolis.

To Camp Devens, Ayer, Mass., base hospital, from Fort Benjamin Harrison, Lieut. ROBERT C. COCHRANE, Indianapolis.

To Camp Meade, Annapolis Junction, Md., base hospital, from Orthopedic Hospital, New York City, Lieut. LOUIS A. BOLLING, Attica.

To Camp Sherman, Chillicothe, Ohio, for duty, from Fort Oglethorpe, Lieut. BROSE S. HORNE, Gas City.

To Camp Wheeler, Macon, Ga., base hospital, from Fort Benjamin Harrison, Capt. JAMES W. DUCKWORTH, Indianapolis; Lieut. JOHN W. PAHMEIER, Indian Springs.

To Oklahoma City, Okla., for instruction in orthopedic surgery, from Camp Cody, Lieut. REAVILL M. WALDEN, Evansville.

To Pittsburgh, for instruction in military roentgenology, from Allentown, Pa., Lieut. HARRY O. JONES, Berne.

To his home and honorably discharged, from Camp Grant, Capt. DANIEL A. CAMPBELL, Boonville.

To his home and honorably discharged, on account of being physically disqualified for active service, from Camp Grant, Lieut. GEORGE C. CARPENTER, Terre Haute.

Honorably discharged, from Camp MacArthur, Lieut. SIDNEY G. CORTNER, Olisco.

Iowa

To Camp Beauregard, Alexandria, La., base hospital, from Fort Riley, Lieut. ARLO R. ZUERCHER, Cedar Rapids.

To Camp Dodge, Des Moines, Iowa, base hospital, Lieut. EDWARD T. EDGERLY, Ottumwa.

To Fort Ontario, N. Y., for duty in his specialty, from St. Elizabeth's Hospital, Washington, D. C., Capt. RICHARD G. EATON, Cherokee.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. HOWARD M. WILLIAMSON, Olin.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieut. ROSCOE D. TAYLOR, Spencer.

To Pittsburgh, Pa., for instruction, and on completion *to Fort McHenry, Md.,* for duty with United States Army General Hospital No. 2, Capt. JOHN R. WALKER, Fort Madison.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieuts. JOHN E. STANSBURY, Cedar Rapids; JAMES H. O'DONOGHUE, Storm Lake.

To San Antonio, Texas, Kelly Field, for duty, from Fort Benjamin Harrison, Lieut. DONALD McELDERRY, Ottumwa.

Kansas

To Fort Riley, Kan., for duty, from Fort Riley, Lieuts. ANDREW ENGBERG, McPherson; THOMAS M. GREENWOOD, Circleville; CLYDE L. MORRIS, Kansas City.

To Kenosha, Wis., The Nash Motors Co., for duty, from Fort Riley, Lieut. CHARLES V. HAGGMAN, Scandia.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieut. THOMAS S. VENARD, Ness City.

To Oklahoma City, Okla., for instruction in orthopedic work, from Douglas, Ariz., Lieut. MARION TRUEHART, Sterling.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieuts. EMANUEL H. CLAYTON, Arkansas City; WILLIAM A. McCULLOUGH, Delevan.

To the inactive list, on account of being physically disqualified for active service, Lieut. ROBERT E. EGGAN, Springhill.

Kentucky

To Camp Cody, Deming, N. M., base hospital, from Fort Benjamin Harrison, Lieut. GEORGE A. CRAFTON, Fulton.

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Lieut. TIMOTHY T. GIBSON, Middlesboro.

To Camp MacArthur, Waco, Texas, from Fort Benjamin Harrison, Lieut. LEONARD CHAMPION, Cadiz.

To Camp McClellan, Anniston, Ala., for duty with Headquarters Military Police, from Camp Greenleaf, Lieut. LOGAN FELTS, Lewisburg.

To Camp Taylor, Louisville, Ky., base hospital, from University of Pennsylvania, Major WALLER C. BULLOCK, Lexington; Capt. JOHN J. MOREN, Louisville.

To Fort Riley, Kan., for duty, Capt. JOHN L. FARMER, Allensville.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. WILLIAM H. NASH, Finchville.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Oglethorpe, Lieuts. HIRAM S. EGGERS, Louisville; ROBERT A. IRVIN, Clay City.

To Philadelphia, Pa., Evans Dental Institute, for instruction, Lieut. WILLIAM G. ECKMAN, Covington.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieuts. PAUL D. MOORE, Calliown; WALTER COX, Lexington.

Louisiana

To Camp Beauregard, Alexandria, La., as member of board for examination of command for tuberculosis, Lieut. HENRY C. LOCHTE, New Orleans.

To Philadelphia, Pa., Evans Dental Institute, for instruction, from Fort Oglethorpe, Capt. JOHN SMYTH, New Orleans.

To Salt Lake City, Utah, to establish a Physical Examining Unit at that place, from Aviation Section Signal Corps, Seattle, Wash., Lieut. LOUIS LEVY, New Orleans.

Maine

To Camp Joseph E. Johnston, Jacksonville, Fla., base hospital, from Camp Gordon, Capt. BERTRAND D. RIDLON, Portland.

To Pittsburgh, Pa., for instruction, and on completion *to Fort Riley*, base hospital, from Fort Riley, Lieut. FRANK W. MERRITT, Jay.

Maryland

To Camp Gordon, Atlanta, Ga., as member of board for examination of command for tuberculosis, from Camp Sheridan, Lieut. ALGERNON D. ATKINSON, Baltimore.

To Camp Logan, Houston, Texas, as assistant to division surgeon, from Camp Greenleaf, Capt. THOMAS R. CHAMBER, Baltimore.

To Camp Meade, Annapolis Junction, base hospital, Lieut. FRANK C. MARINO, Baltimore.

To Fort Myer, Va., for duty, from Washington Barracks, Capt. MAYNARD J. SIMMONS, Indian Head.

To Memphis, Tenn., Aviation School, Park Field, for duty, from Fort Benjamin Harrison, Capt. COMPTON WILSON, Friendship.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Oglethorpe, Lieut. ALEXANDER B. KALBAUGH, Western Port.

To Philadelphia, Pa., Evans Dental Institute, base hospital, Capt. HUGH W. BRENT, Baltimore.

Honorably discharged, on account of being physically disqualified for active service, Lieut. JAMES ETHERIDGE, Baltimore.

Massachusetts

To Army Medical School, Washington, D. C., for instruction in orthopedic surgery, from Camp Devens, Lieut. RICHARD A. CUNNINGHAM, Boston.

To Boston, Mass., Aviation Section, Signal Corps, as member of examining board No. 2, Capt. ROBERT F. SOUTHER, Boston; as member of examining board No. 1, Lieut. WILLIAM J. HARKINS, Boston.

To Camp Devens, Ayer, Mass., base hospital, from University of Pennsylvania, Major WILLIAM F. WESSELHOEFT, Boston; Lieuts. WILLIAM F. WOOD, Boston; from Fort Benjamin Harrison, SOMERS FRASER and RICHARD J. R. CAINES, Boston.

To Camp Sevier, Greenville, S. C., base hospital, from Fort Benjamin Harrison, Lieut. JOHN W. TRASK, Lynn.

To Camp Sheridan, Montgomery, Ala., base hospital, from Fort Benjamin Harrison, Lieut. WYATT S. ROBERTS, Boston.

To Camp Wheeler, Macon, Ga., base hospital, from Fort Benjamin Harrison, Lieut. EDMUND A. ROGERS, Boston.

To Fort Adams, Miss., for duty, from Camp Devens, Lieut. VICTOR S. MERRITT, Springfield, Mass.

To Fort Oglethorpe, Ga., for instruction, from Boston Psychopathic Hospital, Lieut. WILLIAM T. RUMAGE, Arlington.

To Fort Riley, Kan., base hospital, from Fort Riley, Lieut. LEON NEWMAN, Boston.

To Fort Terry, N. Y., for duty, from Camp Devens, Capt. ARTHUR P. PERRY, Boston.

To New York City, Neurological Institute, for instruction in his specialty, from Camp Greene, Lieut. ALFRED P. CHRONQUEST, Hathorne.

To Rockefeller Institute, for instruction, and on completion to his home and the inactive list, Major THOMAS E. CHANDLER, Boston; Lieut. MILE C. GREEN, Boston.

Michigan

To Camp Greene, Charlotte, N. C., Third Division, for duty as division sanitary inspector, from Camp Greenleaf, Major SAMUEL C. GURNEY, Detroit.

To Fort Riley, Kan., for instruction, Lieut. NATHAN J. JESSUP, Detroit.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Benjamin Harrison, Capt. CHARLES E. LONG, Grand Haven; from Fort Riley, Lieut. WILLIAM H. MEDDAUGH, Sand Creek.

To Peoria, Ill., The Holt Tractor Co., for duty, from Fort Riley, Lieut. EDWARD P. WAID, Salem.

To Pittsburgh, Pa., for instruction in military roentgenology, from Fort Oglethorpe, Lieut. JESSE O. PARKER, Owasso.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieut. HARVEY B. McCRORY, Birch Run.

To San Antonio, Kelly Field, for duty, from Fort Benjamin Harrison, Capt. HENRY S. BARTHOLOMEW, Lansing.

To Walter Reed General Hospital, Takoma Park, D. C., for duty, from orthopedic hospital, New York City, Lieut. HAROLD A. BECK, Detroit.

To his home and honorably discharged, on account of being physically disqualified for active service, from Fort Benjamin Harrison, Capt. EDWARD C. RUMER, Flint.

Minnesota

To Camp Custer, Battle Creek, Mich., base hospital, from Allentown, Pa., Lieut. HERBERT H. THOMPSON, St. Paul.

To Camp Pike, Little Rock, Ark., base hospital, from Fort Benjamin Harrison, Lieut. PAUL R. HANKEE, Camion Falls.

To Camp Shelby, Hattiesburg, Miss., base hospital, from Fort Riley, Lieut. LLOYD T. DAVIS, Minneapolis.

To Fort Riley, Kan., base hospital from Fort Riley, Lieut. WILLIAM J. EGAN, Rochester.

To Minneapolis, Aviation Section, Signal Corps, for duty, Capt. ALOYSIUS S. FLEMING, Minneapolis.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieut. BENJAMIN W. KELLY, Aitken.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieuts. THORFINN THARALDSON, Cottonwood; NELS P. ANDERSON, Dunnell.

Mississippi

To Camp Greene, Charlotte, N. C., Third Division, for duty as assistant to division surgeon, from Camp Greenleaf.

To Camp Lee, Petersburg, Va., for duty, Lieut. GEORGE BASKERVILLE, Winona.

To Fort Riley, Kan., for instruction, Lieut. CLEVELAND DAVIS, Morgan City.

To his home and the inactive list, on account of being physically disqualified for active service, from Camp Meade and Walter Reed General Hospital, Lieut. CANNING T. BELL, De Kalb.

Missouri

To Camp Beauregard, Alexandria, La., base hospital, from Fort Riley, Lieut. RALPH L. COOK, St. Louis.

To Camp Funston, Fort Riley, Kan., for duty as division sanitary inspector, Capt. FRANK L. MORSE, St. Louis.

To Camp Pike, Little Rock, Ark., for duty, from Fort Riley, Lieut. PAUL B. CLAYTON, Odessa.

To Camp Taylor, Louisville, Ky., as member of board for examination of command for tuberculosis, Lieut. ROY W. JOHNSON, St. Louis.

To Camp Wheeler, Macon, Ga., base hospital, from Camp Greenleaf, Lieut. LLOYD L. TATE, St. Louis.

To Fort Ontario, N. Y., for duty, from Fort Riley, Lieut. WILLIAM L. KENNEY, St. Joseph.

To Fort Riley, Kan., for duty, from Fort Riley, Lieut. EVERETT L. MORGAN, Graham; for instruction, Lieut. GEORGE O. WILHITE, St. Louis.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieuts. JOHN H. TIMBERMAN, Marston; EDWARD C. WITTWER, Mountain Grove; FRANK HEDGES, Pattonsburg; St. Joseph.

Montana

To Clintonville, Wis., The Four Wheel Drive Co., for duty, from Fort Riley, Lieut. EDWARD A. SWEET, Helena.

To Fort Riley, Kan., base hospital, from Fort Riley, Lieut. EDWARD D. O'NEILL, Kalispell.

Nebraska

To Camp Greenleaf, Fort Oglethorpe, Ga., base hospital, from Camp Greenleaf, Capt. EGERTON T. WILSON, O'Neill.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieut. IRVIN C. MUNGER, Lincoln.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieut. WILLIAM E. DOANE, North Bend.

To Presidio, San Francisco, Calif., for duty as acting quartermaster, from Fort Riley, Lieut. HENRY A. JOHNSON, Tekamah.

Nevada

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieut. WILLIAM L. HOWELL, Gardnerville.

New Hampshire

To Camp Custer, Battle Creek, Mich., for duty, from Fort Benjamin Harrison, Capt. CHARLES A. STURTEVANT, Manchester.

To Camp McClellan, Anniston, Ala., for duty as division sanitary inspector, from Fort McKinney, Me., Major HERBERT I. HARRIS, Fort Constitution.

To Camp Wheeler, Macon, Ga., base hospital from Fort Oglethorpe, Capt. HENRY L. STICKNEY, Manchester.

New Jersey

To Camp Dix, Wrightstown, N. J., base hospital, Lieuts. JAMES S. GREEN, Elizabeth; from Camp Sevier, JAMES F. WALLIS, Pleasantville.

To Camp Joseph E. Johnston, Jacksonville, Fla., base hospital, from Camp Sevier, Lieut. WALTER F. KEATING, Ridgewood.

To Camp Lee, Petersburg, Va., for duty, from Fort Oglethorpe, Lieut. FRANK L. FIELD, Far Hills.

To Camp Upton, L. I., N. Y., base hospital, from Post Graduate Medical School, New York City, Lieut. ROCCO M. NITTOLI, Newark.

To Fort Riley, Kan., for instruction, Lieuts. LEROY L. COLSH, Maplewood; NEIL C. STEVENS, Morristown.

To Governors Island, N. Y., for duty with the 413th Telegraph Battalion, Lieut. ABSALOM A. LAWTON, Somerville.

To Newport News, Va., for duty, from Walter Reed General Hospital, Takoma Park, D. C., Capt. MAURICE ASHER, Newark.

To Philadelphia, Pa., Evans Dental Institute, for instruction, from Camp Greenleaf, Lieut. THOMAS A. CLAY, Paterson.

To Philadelphia, Pa., University of Pennsylvania, for instruction, and on completion *to Camp Dix*, base hospital, Lieut. NELSON K. BENTON, Newark.

To Washington Barracks, Washington, D. C., for duty, from American University, Lieut. ANTHONY G. SACCO, West Hoboken.

New Mexico

To Camp Wheeler, Macon, Ga., Thirty-First Division, as member of board for examination of command for tuberculosis, from Camp Doniphan, Lieut. ORIN J. WHITCOMB, Raton.

To Fort Oglethorpe, Ga., for instruction, from Camp Cody, Capt. OLIVER H. HAYMAKER, Roswell.

New York

To Albany, N. Y., for duty with base hospital No. 33, from Fort Niagara, Lieut. FREDERICK W. McSORLEY, Salem.

To Ann Arbor, Mich., Psychopathic Hospital, for intensive training in his specialty, from Fort Benjamin Harrison, Capt. REEVE TURNER, New York City.

To Army Medical School, Washington, D. C., for instruction in orthopedic surgery, from Fort Niagara, Major FREDERICK N. C. JERAULD, Niagara Falls; Capt. SURSE J. TAYLOR, Albany, from Fort Ethan Allen, Lieut. GEORGE J. GANOW, Fort Dickinson; from Fort Benjamin Harrison, Lieut. MELVIN G. HERZFELD, New York City.

To Boston, Mass. for orthopedic instruction, from Fort Ethan Allen, Lieut. WALTER J. SMITH, Waterville.

To Camp Beauregard, Alexandria, La., base hospital, from Rockefeller Institute, Capt. MORRIS B. BEECROFT, Albany.

To Camp Cody, Deming, N. M., for duty, from Fort Benjamin Harrison, Lieuts. LEON H. PRIOR, Buffalo; SAMUEL ROTH, New York City.

To Camp Devens, Ayer, Mass., as member of board for examination of command for tuberculosis, Capt. BRUNO S. HOROWICZ, New York City; from Fort Benjamin Harrison, Lieut. ALBERT BOWEN, Rochester.

To Camp Dix, Wrightstown, N. J., base hospital, from Plattsburg Barracks, N. Y., Major MENUS S. GREGORY, New York City; from Fort Benjamin Harrison, Lieut. ELLSWORTH J. SMITH, Larchmont.

To Camp Greene, Charlotte, N. C., for duty as division sanitary inspector, from Fort Ethan Allen, Major ISAAC W. BREWER, Geneva.

To Camp Greenleaf, Fort Oglethorpe, for duty from Camp Greenleaf, Lieut. JOHN H. FLYNN, Brooklyn.

To Camp Hancock, Augusta, Ga., base hospital, from Augusta, Ga., Capt. SAMUEL M. STRONG, New York City; from Fort Benjamin Harrison, Lieut. VALENTINE V. BOURKE, Brooklyn.

To Camp Logan, Houston, Texas, for duty, from Fort Benjamin Harrison, Lieut. GEORGE W. BEEBE, St. Johnsville.

To Camp Meade, Annapolis Junction, Md., for duty, from Army Medical School, Lieut. SAUL L. MEYLACKSON, New York City; from Fort Oglethorpe, Lieuts. LEE A. HADLEY, Syracuse; WILLIAM BLANCARD, New York; from New York City, Lieuts. SAMUEL PARNASS, Brooklyn; WILLIAM G. PHILLIPS, Jr., Brooklyn.

To Camp Mills, Garden City, L. I., for duty, Capt. CONSTANTINE J. MacGUIRE, New York City.

To Camp Sevier, Greenville, S. C., base hospital, from Fort Benjamin Harrison, Lieut. LOUIS B. SACHS, New York.

To Camp Sheridan, Montgomery, Ala., for duty, from Fort Oglethorpe, Lieut. BRICKHOUSE WILSON, New York City.

To Camp Upton, L. I., N. Y., base hospital, from Fort Porter, Major HOWARD FOX, New York City; from Fort Benjamin Harrison, Lieut. ARBOR D. MUNGER, Brooklyn; from New York City, Lieut. MAURICE LENZ, New York; from University of Pennsylvania, Lieut. RICHARD F. SEIDENSTICKER, Brooklyn.

To Camp Wheeler, Macon, Ga., base hospital, and on completion to his proper station, Major HANS ZINSSER, New York City; as member of tuberculosis examining board, from Fort Benjamin Harrison, Lieut. MAXWELL K. WILLOUGHBY, Auburn; for duty, from Fort Terry, Lieut. GEORGE N. ACKER, Second, New York City; from Camp Greenleaf, Lieuts. HAROLD B. SCOVERN, New York City; BENJAMIN C. RUSSUM, Brooklyn; JAMES E. WEATHERFORD, Brooklyn; WARREN C. FARGO, New York City.

To Fort Benjamin Harrison, Ind., for duty from Fort Porter, Major JUNIOUS H. McHENRY, New York City.

To Fort Oglethorpe, Ga., for duty with Evacuation Hospital No. 6, from Fort Jay, N. Y., Lieut. ALBERT MARGULIES, Brooklyn.

To Fort Riley, Kan., for duty in his specialty, from Camp Wheeler, Capt. ROBERT KING, Buffalo; for instruction Capt. MARK H. WARD, Suffern; Lieuts. MATHER CLEVELAND, THEODORE B. REED, New York City; for duty, Lieut. EDWARD H. McCAFFREY, Brooklyn; for temporary duty in the base hospital, from Rockefeller Institute, Lieut. WALTER P. BLISS, New York City.

To Montgomery, Ala., for duty, from Fort Benjamin Harrison, Capts. EDGAR S. BULLIS, Glens Falls; GUSTAVUS C. DARLINGTON, New York City; from Fort Oglethorpe, Lieuts. MAX DOBRIN, PERRY L. HELMICK, New York City.

To Newport News, Va., for duty at Camp Stuart, from Camp Greenleaf, Lieut. HENRY S. BARTHOLOMEW, New York City.

To New York City, for duty with Base Hospital No. 3, from Rockefeller Institute, Major GEORGE BAEHR, New York City; *to Bellevue Hospital*, for instruction, and on completion *to U. S. Army General Hospital, No. 1*, Williams Bridge, New York, for duty, from Allentown, Pa., Lieut. THOMAS E. LAVELLE, New York City; for instruction in orthopedic surgery, from Camp Bartlett, Lieut. IRA W. LIVERMORE, Gowanda; for duty, from Aviation Section, Signal Corps, Lieut. FEDOR L. SENGER, Brooklyn; *to Vanderbilt Clinic*, Cornell Medical College, from School of Roentgenology, Lieut. HARRY R. FOERSTER, New York City.

To Pittsburgh, Pa., for instruction in military roentgenology, from Fort Oglethorpe, Lieut. WILLIA MENGEL, New York City.

To Philadelphia, Pa., Evans Dental Institute, for instruction, Capt. HARRY B. HUVER, Williamsville; on completion to his home and the inactive list, Lieut. ALEXANDER L. SMITH, Rochester.

To Plattsburg Barracks, New York, to reexamine certain candidates for commissions, and on completion of this duty to his proper station, Capt. SANGER BROWN, Second, White Plains.

To Rockefeller Institute, for instruction in laboratory work, Lieuts. HARRY PLOTZ, Brooklyn; from Army Medical School, JULIAN S. MEYER, New York; HARRY C. SCHMEISSER, New York City.

To Tenafly, N. J., for duty, from Army Medical School, Lieut. BRYON D. WHITE, Brooklyn.

To his home and the inactive list, Capt. JOSEPH McDONALD, New York.

To his home and the inactive list on account of being physically disqualified for active service, from Camp Wheeler, Lieut. HENRY S. FRUTTNIGHT, New York City.

To his home, from Camp Gordon, Lieut. CARLTON A. LEE, Brooklyn.

Honorably discharged, Capt. LOUIS HAUSWIRTH, New York City; Lieut. ALFRED BRAUN, New York City.

North Carolina

To Neurological Institute, New York, for instruction, Capt. EDWIN B. FEREBEE, Raleigh.

To New York City, Bellevue Hospital, for instruction and on completion of this course *to Rockefeller Institute*, for further instruction and on completion *to Camp Sheridan*, base hospital, Capt. EVERETT A. LOCKETT, Winston-Salem.

To report by wire to the commanding general, Southeastern Dept., from Chickamauga Park, Lieuts. LOUIS H. WEBB, Chapel Hill; NEWTON G. WILSON, Summerfield.

North Dakota

To Camp Beauregard, Alexandria, La., base hospital, from Fort Riley, Lieut. GEORGE V. JAMIESON, Devils Lake.

To Camp Shelby, Hattiesburg, Miss., base hospital, from Fort Riley, Lieut. JOHNSTON C. JACKMAN, Minot.

To Fort Riley, Kan., base hospital, from Fort Riley, Lieut. ADOLPH G. MAERCKLEIN, Ellendale.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieut. HIRAM LaM. YOUTZ, Willow City.

To New York City, Neurological Institute, for intensive training in brain surgery, from Fort Benjamin Harrison, Capt. JAMES P. AYLEN, Fargo.

Ohio

To Camp Dix, Wrightstown, N. J., for duty, from Fort Benjamin Harrison, Lieut. SAMUEL J. ELLISON, West Union.

To Camp Dodge, Des Moines, Ia., base hospital, from Fort Oglethorpe, Lieut. ROBERT R. SATTLER, Cincinnati; from Fort Benjamin Harrison, Lieut. RALPH W. FAUS, Wellington.

To Camp Grant, Rockford, Ill., for duty, from Fort Benjamin Harrison, Lieut. EDWIN G. SCHWARZ, Cleveland.

To Camp Jackson, Columbia, S. C., for duty, from New York City, Lieut. GEORGE B. BOOTH, Toledo.

To Camp Sevier, Greenville, S. C., for duty, from Fort Benjamin Harrison, Lieut. ARTHUR W. CARLEY, Dayton.

To Fort Oglethorpe, Ga., for a course of instruction, from Camp Cody, Lieuts. FRANK E. SNIDER, Madisonville; from Post Graduate Hospital, New York City, BARNEY J. HEIN, Toledo.

To Fort Riley, Kan., for a course of instruction, Lieut. FRED L. ANDREWS, Cleveland.

To Oklahoma City, Okla., for a course of instruction in orthopedic surgery, Lieut. ZALMON O. SHERWOOD, Geneva.

To Philadelphia, Evans Dental Institute, for a course of instruction and upon completion of this course to return to his proper station, from Columbus Barracks, Capt. GEORGE C. SCHAEFFER, Columbus.

To Washington, D. C., for duty as pharmacologist at the American University, from Gas School, Fort Sill, Ark., Capt. JAMES D. PILCHER, Cleveland; to Government Hospital for Insane, for duty, from Army General Hospital, No. 1 Capt. WILLIAM A. SEARL, Cuyahoga Falls.

To his home and honorably discharged from the Medical Reserve Corps, on account of being physically disqualified for active service, from Camp Wadsworth, Lieut. CHARLES C. MANDEVILLE, Galion.

To his home and relieved from further active duty in the Medical Reserve Corps, from Fort Des Moines, Lieut. LOUIS A. CORNISH, Cincinnati.

Honorably discharged from the Medical Reserve Corps on account of being physically disqualified for active service, Lieut. JERRARD W. COOMBS, Camden.

Oklahoma

To Fort Riley, Kan., base hospital, from Fort Riley, Lieut. CHARLES C. GARDNER, Ashland.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. THOMAS M. BOYD, Norman.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Oglethorpe, Lieut. JAMES R. BOST, Cashion.

To Portland, Oregon, for assignment to duty with aero squadrons, from Fort Riley, Lieuts. FRANK R. BUCHANAN, Canton; PENDELTON GARDNER, Haileyville.

To Camp Travis, Fort Sam Houston, Tex., base hospital, Lieut. ARTHUR T. BLACHLY, Portland.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. LEONARD M. VINCENT, Crane.

Pennsylvania

To Army Medical School, Washington, D. C., bacteriologic laboratory, from Fort Benjamin Harrison, Lieut. SOLOMON F. HOGE, Philadelphia.

To Camp Custer, Battle Creek, Mich., for duty, from Fort Benjamin Harrison, Lieut. HENRY B. INGLE, Bedford Springs.

To Camp Greene, Charlotte, N. C., for duty with Headquarters Military Police, from Camp Greenleaf, Lieut. JOSEPH J. AUSTRA, Philadelphia.

To Camp Greenleaf, Fort Oglethorpe, for instruction, Lieut. JAMES C. McCONAUGHEY, Wayne.

To Camp Lee, Petersburg, Va., base hospital, from University of Pennsylvania, Lieut. FREDERICK J. GARLICK, Philadelphia.

To Camp Logan, Houston, Tex., base hospital, from Orthopedic Hospital, New York, Lieut. RALPH L. RUTLEDGE, McKeesport.

To Camp Meade, base hospital, Capt. EDWARD McI. HALEY, Blossburg.

To Camp Mills, Garden City, L. I., base hospital, from New York, Lieut. JOHN W. FREY, Ovalon.

To Camp Sherman, base hospital, Lieut. LAWRENCE H. FITZGERALD, Pittsburgh.

To Camp Taylor, Louisville, Ky., for duty, from Fort Oglethorpe, Lieut. CLARENCE H. KETTERER, Butler.

To Camp Travis, Fort Sam Houston, Tex., for duty, from Fort Oglethorpe, Lieut. DeWITT B. NETTLETON, Sewickley.

To Camp Wheeler, Macon, Ga., base hospital, Major JOSEPH SAILOR, Philadelphia; from Fort Benjamin Harrison, Lieuts. JAMES B. CARROLL, Dunbar; REEVES W. DeCROW, Collegeville; from Atlanta, Ga., Lieut. RUBEN A. E. PETERSON, Allentown; from Fort Oglethorpe, Lieuts. THOMAS W. DRUCE, Philadelphia; FRANCIS E. DONNELLY, Wilkes-Barre, from Camp Shelby, Hattiesburg, Miss.; Lieut. JOHN H. MUSSER, JR., Philadelphia.

To El Paso, Tex., for duty, with Ambulance Co. No. 1, from Chickamauga Park, Ga., Lieut. HUGH M. SHANNON, Philadelphia.

To Fort Oglethorpe, for instruction, from Camp Meade, Lieut. JOHN W. MANN, Pittsburgh.

To Fort Riley, Kan., for instruction, Lieut. BENJAMIN ROBINSON, Philadelphia.

To Garden City, L. I., N. Y., for duty, Major WALTER S. CORNELL, Philadelphia.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Oglethorpe, Lieut. ALBON E. FICHTNER, Johnston.

To Hoboken, N. J., for duty, from Fort Oglethorpe, Lieut. HARRY M. READ, York.

To Newport News, Va., for duty at Camp Stuart, from Camp Greenleaf, Lieut. FRANK D. CAMPBELL, Slippery Rock.

To Philadelphia, Pa., for duty with base hospital No. 20, Major GEORGE M. MERSON, Philadelphia; *to Evans Dental Institute*, for instruction, and on completion *to Wrightstown, N. J.*, base hospital, Major GEORGE M. DORRANCE, Philadelphia; for duty, from Neurological School, University of Pennsylvania, Capt. JOHN LOWMAN, Johnstown; *to Evans Dental Institute*, for instruction, Lieuts. HARRY S. CARMANY, HAROLD A. FLETCHER, Philadelphia; *to Jefferson Hospital* for duty, from Neurological School, University of Pennsylvania, Lieut. GUY M. MUSSER, Punxsutawney.

To Walter Reed General Hospital, Takoma Park, D. C., for temporary duty, from Camp Meade, Lieut. JAMES H. BALDWIN, Philadelphia.

To Williams Bridge, N. Y., United States General Hospital, No. 1, for temporary duty, from New York Orthopedic Hospital, Lieut. JAMES L. GILMORE, Pittsburgh.

To Pittsburgh, Pa., for instruction in military roentgenology, from Fort Oglethorpe, Capt. JOHN J. McKENNA, Philadelphia; Lieut. PATRICK J. O'DEA, Scranton.

To Rockefeller Institute, for instruction in the therapy of pneumonia, Lieut. CLIFFORD C. HARTMAN, Pittsburgh; for instruction and on completion to his proper station, from Camp Hancock, Lieut. WILLIAM N. PARKINSON, Philadelphia.

To his home and honorably discharged on account of being physically disqualified for active service, from Newport News, Va., Lieut. FREDERICK W. KNIPPEL, Mercer.

South Carolina

To Camp Greene, Charlotte, N. C., for duty with the Headquarters Military Police, from Camp Greenleaf, Lieut. ISAAC H. GRIMBALL, Ridgeland.

To Camp Robinson, Sparta, Wis., for duty, from Fort Oglethorpe, Capt. THEODORE C. STONE, Aiken.

South Dakota

To Fort Sill, Okla., base hospital, from Camp Pike, Capt. THOMAS W. MOFFITT, Deadwood.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieut. FRANCIS T. READ, South Shore.

Tennessee

To Army Medical School, Washington, D. C., for instruction in orthopedic surgery, Capt. Alphonse H. Meyer, Memphis.

To Camp Gordon, Atlanta, Ga., as member of board for examination of command for tuberculosis, from Fort Oglethorpe, Lieut. ENOCH S. SEALE, Nashville.

To Camp Greene, Charlotte, N. C., for duty, from Fort Oglethorpe, Lieut. CURTIS R. SENTER, Memphis.

To Fort McPherson, Ga., base hospital, from Camp Greenleaf, Lieut. CHARLES D. BLASSINGAME, Memphis.

To Fort Myer, Va., from Camp Meade, Lieut. ALLEN L. LEAR, Sewanee.

To Fort Oglethorpe, Ga., for duty with Field Hospital No. 3, from Fort Oglethorpe, Lieut. LOUIS F. VERDEL, Memphis.

To Oklahoma City, Okla., for instruction in orthopedic surgery, from Fort Oglethorpe, Lieut. BENJAMIN L. SCHOOLFIELD, Memphis.

To Walter Reed General Hospital, Takoma Park, D. C., for duty in connection with the Mobile Operating Unit, from Army Medical School, Lieut. PAUL E. McNABB, Knoxville.

Texas

To Camp Logan, Houston, Tex., for duty with the Headquarters Military Police, from Camp Greenleaf, Lieut. PIERRE F. HIGGINS, Fort Worth.

To Camp Meade, Annapolis Junction, Md., for duty, from Fort Oglethorpe, Lieut. KARL CHAMBERS, Jasper.

To Fort Oglethorpe, Ga., for instruction, from Camp Cody, Lieuts. HENRY BRADBROOK, Cat Spring; ROBINSON H. SALMON, Maypearl.

To Oklahoma City, Okla., for instruction in orthopedic surgery, from Camp Fort Bliss, Lieut. FREDERICK E. HUDSON, Anson.

Virginia

To Camp Jackson, Columbia, S. C., for duty, from Fort Oglethorpe, Lieut. BERNARD BARROW, Barrows Store.

To Philadelphia, Pa., Evans Dental Institute, for instruction, Lieuts. LEWIS G. RICHARDS, Roanoke; from Fort Oglethorpe, JOHN B. HALLIGAN, Petersburg; for instruction and on completion *to his proper station*, from Fort Myer, Lieut. MINOR G. LILE, University.

To report by wire to the commanding general Southeastern Dept. from Chickamauga Park, Lieut. JAMES C. MOTLEY, Abingdon.

To his home and the inactive list on account of being physically disqualified for active service, Lieut. GRANVILLE EASTHAM, Rapidan.

Washington

To Camp Lewis, American Lake, Wash., base hospital, Lieuts. HIRAM S. ARGUS, EDWIN A. MONTAGUE, HARRY G. WILLARD, Tacoma.

To Camp Mills, Garden City, L. I., for duty, Lieut. IVAN J. D. SHULER, Seattle.

West Virginia

To Camp Cody, Deming, N. M., base hospital, from Camp Cody, Capt. LEWIS C. COVINGTON, Charleston.

To Camp Greene, Charlotte, N. C., for duty as assistant to the Division Surgeon, from Camp Greenleaf, Lieut. WILLIAM H. McLAIN, Wheeling.

To Camp McClellan, Anniston, Ala., for duty with Headquarters Military Police, from Camp Greenleaf, Lieut. WILLIAM NELSON, Hansford; from Fort Benjamin Harrison, Lieut. ADLAI E. CALLAHAN, Parkersburg.

Wisconsin

To Camp Beauregard, Alexandria, La., base hospital, from Fort Riley, Lieut. EMIL A. RUKA, Bascobel.

To Camp Grant, Rockford, Ill., base hospital, from Fort Benjamin Harrison, Lieut. ARTHUR C. DANA, Fond du Lac.

To Camp Jackson, Columbia, S. C., as member of board for examination of command for tuberculosis, from Camp Sheridan, Capt. MICHAEL R. WILKINSON, Oconomowoc; Lieut. HARRY C. MIX, Green Bay.

To Fort Riley, Kan., for duty, from Fort Riley, Lieut. GERHARD A. BADING, Milwaukee.

To Fort Sheridan, Ill., for duty, from Fort Benjamin Harrison, Major OTHO A. FIEDLER, Sheboygan.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Riley, Lieuts. RAYMOND A. HEBRON, Cataract; ALBERT H. KULIG, Dodge; CHARLES M. PEARSON, Ogema; EDWARD P. EVANS, S. Milwaukee; ATHOL H. WEDGE, Waupun.

To Newport News, Va., for duty at Camp Stuart, from Camp Greenleaf, Lieut. GEORGE H. SCHLENKER, Cazenovia.

To New York City, Neurological Institute, for intensive training from Psychopathic Hospital, Boston, Mass., Lieut. CHARLES C. ROWLEY, Winnebago.

To Portland, Ore., for assignment to duty with aero squadrons, from Fort Riley, Lieuts. DONALD G. HUGO, Chilton; HIRAM A. FULTON, Eau Claire; REUBEN J. ELLIOT, National Home; LESLIE A. VAN DER LINDE, Wautoma.

To his home and to report by wire to the Surgeon-General from Camp MacArthur, Lieut. JAMES GURNEY TAYLOR, Milwaukee.

To the inactive list, from University of Pennsylvania, Lieut. ORVILLE R. LILLIE, Milwaukee.

CORRECTIONS

Attention is called to the following corrections in previous lists of orders to medical officers:

In the issue of October 6: *To Fort Benjamin Harrison* for instruction, CHARLES A. ROBERTSON of Hopkinsville, Ky., instead of C. A. Robertson of Ridgetop, Tenn.

In the issue of November 24: *To Camp Cody*, base hospital, from Fort Benjamin Harrison, Lieut. ELMER E. JOHNSON, Philadelphia, instead of Elmer S. Johnson, Oregon, Wis.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Pneumonia Quarantine Ordered.—The health commissioner of Chicago issued a notice, November 25, to the effect that "Pneumonia is a contagious disease and under city ordinances must be reported to the Department of Health. Beginning December 1, the Commissioner of Health will placard all reported cases of pneumonia."

Personal.—Col. William Stephenson, M. C., U. S. Army, department surgeon, Central Department, has been transferred to a similar position in the Eastern Department, with station at Governor's Island, N. Y.——Col. Henry I. Raymond, M. C., U. S. Army, Fort Mason, Calif., has succeeded Colonel Stephenson as department surgeon, Central Department.——Dean Arthur I. Kendall of Northwestern University Medical School, Chicago, delivered an address on "Recent Development in Intestinal Bacteriology," before the Philadelphia Pathological Society, November 2.

Clinical Conference on Tuberculosis.—The first clinical conference on the early diagnosis of tuberculosis under the auspices of the State Council of Defense, the State Department of Public Health and the Illinois Tuberculosis Association, constituting the Cooperating Committee on the Tuberculosis War Problem of Illinois, was held at Springfield, November 22-24. This conference was attended by thirty physicians, each delegated as county medical director on tuberculosis from his respective county. The clinical work was carried out in the dispensary of the Springfield Tuberculosis Association, the Springfield Open Air Colony, St. John's Hospital and the laboratory of the State Department of Public Health by Dr. Orville W. McMichael and Dr. Ethan Allen Gray, Chicago, Dr. James Pettit, Ottawa, and Dr. George Thomas Palmer, Springfield. This is the first of several conferences provided for in the Illinois tuberculosis war program, to provide one physician proficient in the diagnosis and treatment of tuberculosis in each county to meet the war time needs of the military and civil population.

INDIANA

New Hospital.—A contagious disease hospital is to be built as a separate unit of the Indianapolis City Hospital at a cost of $90,000. The plans call for the construction of a two-story brick and concrete building.

Smallpox Epidemic.—An epidemic of smallpox is reported to prevail in Fort Wayne, where there are now more than 200 cases. In addition there are forty-three cases in Grabill, New Haven, Huntertown, Allen and Aboite.

New Medical School.—The University of Notre Dame has established a medical department, which is offering the first two years of the medical course. Two years of college work are required for admission, constituting, with the two medical years, the first four years of the six-year combined course for the baccalaureate and M.D. degrees.

KENTUCKY

Hospital for Insane Burns.—The building for tuberculous patients at the State Hospital for the Insane, Lakeland, was destroyed by fire, November 26.

Personal.—Dr. Henry Enos Tuley, dean of the Medical Department of the University of Louisville, has accepted the appointment of superintendent of Louisville's new City Hospital from Mayor Smith.——Dr. A. E. Ferguson, Austin, has been appointed a member of the State Tuberculosis Board, succeeding Dr. Richard T. Yoe, Louisville, term expired.——Dr. W. Lucien Heizer, Bowling Green, secretary of the State Tuberculosis Commission, and formerly State Registrar of Vital Statistics, is ill with diphtheria at his home in Bowling Green.

MARYLAND

Personal.—Dr. Harry S. Jarrett, Towson, who has been under treatment at the Mercy Hospital, Baltimore, has returned home, and his condition is much improved.——Dr. Lewellys F. Barker of the Johns Hopkins Hospital delivered a lecture, illustrated by lantern slides, at the New York Academy of Medicine, December 7, on "The General Diagnostic Study by the Internist."

Dental and Medical Affiliation.—The first joint meeting of the Maryland State Dental Association and the Baltimore City Medical Society took place at Osler Hall, Baltimore, November 30. Dr. Weston A. Price, Cleveland, director of the National Institute of Dental Research, addressed the meeting on "Some Studies on the Relationship Between Oral Focal Infections and Localized and Systemic Diseases."—— A recent affiliation has been effected between the Medical and Chirurgical Faculty of Maryland and the State Dental Association, whereby the dentists have become members of the faculty. A dental library is being collected.

MICHIGAN

New Hospital for Marquette.—A contagious disease hospital, to cost $10,000, will be erected by the St. Luke's Hospital Association in Marquette.

Tri-County Sanatorium Planned.—A meeting was held at Grand Haven, November 8, at which the question of erecting a tuberculosis sanatorium to be used jointly by Muskegon, Ottawa and Allegan counties was discussed. It is believed that a tri-county sanatorium can be much more economically administered than a separate institution for each county.

Personal.—Dr. Bartlett H. McMullen, mayor of Cadillac, underwent an operation recently in Rochester, Minn., for disease of the jaw, and is reported to be doing well.——Dr. James W. Inches, health officer of Detroit, who has been on duty in France, expects soon to return on leave.——Dr. George M. Belhumeur, Negaunee, has been appointed chief of the Kimbley Clark Company at Niagara, Wis.

MINNESOTA

Fellowships in University.—Fellowships in medicine, surgery, nervous and mental diseases, ophthalmology and otolaryngology are available at the University of Minnesota, under annual stipends in the three-year course, respectively, of $500, $750 and $1,000.

Society Organizes.—Thirteen members of the medical profession of Stillwater and Washington counties met at Stillwater, November 19, and reorganized the Washington County Medical Society, electing the following officers: president, Wade R. Humphrey; vice presidents, Drs. Gustavus A. Newman and Burton J. Merrill, and secretary-treasurer, Dr. Frank G. Landeen, all of Stillwater.

Personal.—Dr. Marion M. Hursh, Grand Rapids, is remodeling the parsonage of the Methodist Church, and will use it as an office and hospital.——Dr. Donald E. Baxter, Minneapolis, sailed for France, November 23, to take charge of the reconstruction of the Children's Hospital under the general war board.——Dr. Richard O. Beard of the College of Medicine of the University of Minnesota, Minneapolis, was the principal speaker at a mass meeting of citizens of Willmar and Kandiyohi counties to exploit the establishment of a general hospital.

Southern Minnesota Physicians Meet.—The annual meeting of the Southern Minnesota Medical Society was held in Mankato, November 26 and 27, under the presidency of Dr. Aaron F. Schmitt, Mankato. Addresses were delivered by Col. Henry S. Greenleaf, M. C., U. S. Army, Fort Snelling; Major William J. Mayo, Rochester; Lieut. Edward W. Ryerson, Chicago, and others. The following officers were elected: president, Dr. Melvin S. Henderson, Rochester; vice presidents, Drs. Alphonse E. J. Sohmer, Mankato, and Peter F. Holm, Wells, and secretary-treasurer, Dr. George F. Merritt, St. Peter.

Hospital News.—At a meeting of the Commercial Club, held in Rice Lake, November 14, resolutions were passed favoring the erection of a hospital to cost $9,500.——A thoroughly modern and well-equipped hospital building, with accommodation for twelve or fourteen patients, is to be erected in Appleton, in the spring. About $5,000 has already been subscribed for the enterprise.——The West Cottage at the Glen Lake Sanatorium was formally opened by the Hennepin County Sanatorium Commission, November 24. The opening of this cottage provides forty-four additional beds for the sanatorium, making a total of 104 beds.

MISSOURI

Personal.—Dr. Oscar J. Raeder, assistant superintendent of the City Sanitarium, St. Louis, has resigned his position to study neuropathology at the Boston Psychopathic Hospital,

under Elmer E. Southard.——Dr. John J. Evans, Manes, being compelled by a paralytic stroke to retire from practice, has been elected an honorary member of the Wright County Medical Society.

Hughes Brothers Convicted.—Drs. Ulysses S. G. Hughes and John H. Hughes, Kansas City, charged in the federal court with illegal drug selling, and convicted, are said to have been sentenced, November 19, to four years' imprisonment in the Federal Penitentiary, Leavenworth. One brother was convicted on eleven counts, and the other on nineteen, and both are said to have been previously convicted on the violation of the Harrison Narcotic Law, in the federal court in Kansas.

NEW YORK

State Troopers Aid in Maintaining Quarantine.—An outbreak of smallpox in the Cattaraugus Indian Reservation recently made it necessary to quarantine the entire reservation. Owing to the size of the reservation a detail of state troopers were despatched to the reservation on the request of the state health department. They effectively surrounded the reservation and maintained a satisfactory quarantine.

New York City

Harvey Society Lecture.—The fourth lecture of the Harvey Society series, delivered at the New York Academy of Medicine, December 8, was by Prof. Aldred S. Warthin, M.D., of the University of Michigan, Ann Arbor, on "The New Pathology of Syphilis."

New Section Hospital.—Dr. Henry Fairfield Osborn, president of the American Museum of Natural History, in cooperation with H. F. Beers, superintendent of construction of the museum, has designed a field hospital suitable for use in the army, and in Red Cross and general hospital work. The hospital is constructed in 5-foot units so that it can be taken apart and reconstructed by unskilled labor, and can be easily transported. The device can also be converted into a dwelling house. A large model is on exhibition at the American Museum of Natural History.

Personal.—Dr. James P. Warbasse, Brooklyn, has been elected president of a newly organized body known as the Consumers' Cooperative Society, the object of which is to arouse trades unions and consumers in general in a plan for the establishment of cooperative stores which will do away with the middleman's profit.——Dr. and Mrs. Simon Baruch celebrated their fiftieth wedding anniversary, November 27, by a reception at Sherry's, at which more than 1,000 guests were present.——Dr. William Seaman Bainbridge has had the degree of LL.D. conferred on him by the trustees of Lincoln Memorial University. Dr. Bainbridge is about to sail for foreign service.——Dr. Abraham Stone, Williamsburg, narrowly escaped death by gas asphyxiation in his home, November 20.

Annual Meeting of County Medical Society.—The one hundred and twelfth annual meeting of the Medical Society of the County of New York was held on the evening of November 25. Resolutions were passed for presentation to Congress aiming at the repeal of Section 209 of the excess profit tax, which imposes a tax of 8 per cent. on all incomes over $6,000 per annum derived from labor. It was pointed out that this law worked a great injustice to medical men in that they were not only taxed for working but any time they entered the service their income from the practice of medicine stopped altogether. The following officers were elected: president, Dr. Howard C. Taylor; vice presidents, Drs. Charles H. Peck and Samuel A. Brown; secretary, Dr. Daniel S. Dougherty; assistant secretary, Dr. J. Milton Mabbott, and treasurer, Dr. James Pedersen.

Two Committees Working for New Drug Laws.—November 28, two conferences were held in this city for the discussion of ways and means of controlling the traffic in habit-forming drugs. One of these committees was the Whitney Legislative Committee. This committee has decided to make a thorough investigation of the drug evil as it exists in this city at the present time. Beginning December 5, it will hold a series of hearings at which it will take testimony in regard to various phases of the drug traffic. What the committee desires to accomplish is to put the law in such shape as to prevent future addiction and to cure as many of the present addicts as possible. The other committee which met at the same time was the New York City Committee of Drug Evils. The members of this committee agreed that what was most needed was federal control of the traffic in narcotic drugs of a definite and comprehensive sort. The statement was made by Dr. Campbell, physician in charge of the Harlem Prison, that there were from 10,000 to 15,000 young men in New York City who were drug addicts and in need of some compulsory form of treatment. A bill was submitted for the consideration of this committee which provides that the government shall destrict the sale and manufacture of narcotic drugs through the imposition of a tax which would tend to make the distribution of drugs prohibitive for any but legitimate purposes.

PENNSYLVANIA

Personal.—Major John A. Hawkins, M. R. C., U. S. Army, Pittsburgh, who is now stationed at Allentown, was presented, November 22, with a fund of more than $4,500 for the equipment of the ambulance companies under his command.——Dr. John J. Coffman, Scotland, has resigned after eighteen years of service as secretary of the Franklin County Medical Society.——Dr. Samuel G. Dixon, state commissioner of health, who has been ill in the Pennsylvania State Hospital, Philadelphia, is reported to be convalescent.

Philadelphia

Baby Clinic Opened.—A baby clinic in charge of Dr. Lida Stewart-Cogill was opened yesterday at the Women's College Hospital. Instructions will be given to mothers daily.

Women Doctors Needed for Army.—According to Dr. Emily Dunning Barringer, New York, vice chairman of the Medical Women's National Association, who spoke at the meeting of the Women's Hospital Medical Society, in the Women's Medical College Hospital, November 21, twelve women physicians who are physically, morally and mentally fit are needed to serve with the American Army. The women who volunteer must be able to speak French.

Personal.—Dr. Edwin B. Cragin, professor of obstetrics and gynecology at Columbia University, New York, addressed the Obstetrical Society of Philadelphia at the College of Physicians, December 6, on "The Functions of a Woman's Hospital in a Large City," and was the guest of honor at a reception held at the Rittenhouse Hotel immediately following the meeting.——Dr. Charles S. Turnbull has been reappointed a member of the board of managers of the State Institution for Training of Deaf Children.——Dr. Robert C. Barrett has been elected acting roentgenologist to the Orthopedic Hospital during the absence of Dr. Ralph S. Bromer on military service.

RHODE ISLAND

Mass Meeting for Nurses.—November 11, a mass meeting was held in the Rhode Island State Medical Society Building, Providence, under the auspices of the Rhode Island Association of Graduate Nurses, to interest nurses in enrolling for home service in cantonment hospitals. Dr. G. Alder Blumer, Providence, presided.

Personal.—Dr. Frank A. Fearney, Narragansett Pier, has been appointed medical examiner (coroner) for the town of Narragansett, to succeed Lieut. Malford W. Thewlis, M. R. C., U. S. Army, resigned to enter military service.——Dr. Ransom H. Sartwell has been appointed resident physician to state penal institutions, with the exception of the almshouse, and the Exeter School for the Feebleminded.

WASHINGTON

Personal.—Dr. William F. West has been appointed a member of the board of health of Everett, succeeding Dr. John F. Beatty, resigned on appointment as health officer.——Dr. Leon G. Woodford has resigned as city health officer of Everett to accept a position of superintendent and physician in charge of the Snohomish County Tuberculosis Sanatorium, Aldercrest.——Dr. Jarrett H. Farrell, Spokane, has been appointed bailiff in the court of Superior Judge Oswold.——Dr. Edward B. Nelson has been elected president, Dr. Foster M. Hoag, vice president, and Dr. I. Rebecca L. Muir, secretary-treasurer of the staff of the Deaconess Hospital, Spokane.

WISCONSIN

Campaign for Hospital.—The campaign to raise $500,000 for Columbia Hospital, Milwaukee, was opened, November 20, at a meeting and banquet held in the Hotel Pfister, and John G. Bowman was the chief speaker of the evening.

Personal.—Dr. Frederick M. Harris, formerly health officer of Fond du Lac and director of the state cooperative laboratory at St. Agnes Hospital, has resigned to enter private practice.——Dr. Frederick C. Christensen, Racine, underwent

operation for appendicitis, November 17, and is reported to be doing well.——Dr. George N. Hidershide, Arcadia, is seriously ill with pneumonia.——Dr. Hugh P. Greeley, Waukesha, has gone to New York to take up special research work at the Rockefeller Institute.

Sanatorium Notes.—After listening to the plea of Dr. Fred T. Nye, Beloit, for the establishment of a sanatorium for Rock County, the county board, November 16, postponed action until the January meeting of the board.——The Ashland County Board, by unanimous vote, November 16, adopted the resolution favoring a tuberculosis sanatorium, and made an appropriation of $40,000 toward the erection of a building, with the provision that Bayfield and Iron counties aid in the project.——The board of supervisors of LaCrosse County, November 15, made an appropriation of $15,000 to complete the LaCrosse County Tuberculosis Sanatorium, which will be ready for occupancy in the spring.

CANADA

Hospital Burns.—The Hotel Dieu War Hospital at Ste. Hyacinthe, Que., was destroyed by fire, November 28. The patients, 1,000 in number, were removed in safety.

Diphtheria Death Rate Lowered.—During November the death rate from diphtheria has materially lessened in the province of Ontario. In fact, it dropped to the lowest figure in the history of the province. During the month in 1917 there were 432 cases reported, with sixteen deaths, as against 467 cases in the same month in 1916, with twenty-eight deaths. The health officials state that in the month free antitoxin was distributed at a cost of $3,907 which has no doubt brought about the low death rate from that disease. Infantile paralysis has almost disappeared from the province.

Personal.—Col. Harry M. Jacques, Toronto, medicals overseas, was invested with the Distinguished Service Order at Buckingham Palace, Nov. 29, 1917.——Lieut.-Col. Herbert S. Birkett, dean of the medical faculty of McGill University, Montreal, who has been overseas two years in command of McGill University Base Hospital, has resigned on account of continued illness. Lieut.-Col. John M. Elder, Montreal, has taken over the command.——Dr. Howard A. Kelly, Baltimore, visited Guelph, Ont., November 30. He was the guest of Dr. Alfred T. Hobbs of the Homewood Sanitarium. Dr. Kelly held a surgical clinic at the General Hospital, performed two or three operations, and gave an illustrated lecture on the use of radium in the treatment of disease. He was banqueted by the physicians of Guelph, and in the evening addressed the two Canadian clubs on "The Civic Duty of the Christian Citizen."

GENERAL

Roentgenologists to Meet.—The fourth annual midwinter meeting of roentgenologists will be held at the Hotel Traymore, Atlantic City, Friday evening and Saturday, Jan. 4 and 5, 1918, to which all physicians interested are invited.

Tri-State Physicians Meet.—The forty-fourth annual meeting of the Tri-State Medical Society of Indiana, Ohio and Michigan was held in LaPorte, Ind., November 21, under the presidency of Dr. Miles F. Porter, Fort Wayne, Ind. At the banquet in the evening, Dr. Frank R. Leeds, Michigan City, Ind., presided as toastmaster, and addresses were delivered by Rev. C. B. Moulinier, S. J., Regent of Marquette University, Milwaukee, Wis., on "Necessity of Standardizing Hospitals"; by Albert J. Ochsner, Chicago, on "After Treatment of a Surgical Case," and by Dr. Frank Billings, Chicago, on "Russia as Observed by the Red Cross Commission." The following officers were elected: president, Dr. Julius H. Jacobson, Toledo, Ohio; vice president, Dr. George V. Brown, Detroit; secretary, Dr. George W. Spohn, Elkhart, Ind. (reelected), and treasurer, Dr. Harry F. Mitchell, South Bend, Ind. (reelected). Detroit was selected as the place of meeting for 1918.

Bequests and Donations.—The following bequests and donations have recently been announced:

Hospital for Crippled and Deformed Children; Rosewood State Training School, Owings Mills, Md.; Presbyterian Eye, Ear and Throat Hospital; Provident Southern Hospital, and Maternité Hospital, Baltimore, each $2,000, by the will of Ferdinand Dietsch.

New York Post-Graduate Hospital, $1,000, the proceeds of a benefit, for the use of a babies' ward.

Adirondack Cottage Sanatorium, Saranac, N. Y., one-half the residuary estate of Robert W. Patterson, which is valued at about $1,000,000.

Lakeside Hospital, Cleveland, $1,000,000, and St. Vincent's Charity Hospital, Cleveland, $200,000, by the will of Oliver H. Payne, New York.

Alumni Association of the Jefferson Medical College, an ultimate bequest of $10,000, to become operative on the death of his widow, and to be known as a memorial to his widow and mother, by the will of Dr. Joseph M. Malatesta.

Lankenau Hospital, Philadelphia, a donation of a building fully equipped and valued at $60,000, by Charles A. Smith; cash contributions of $8,000, and a donation from the alumnae of the nurses' school of $5,000 for a free bed for nurses.

St. Agnes Hospital, Philadelphia, cash donations of $1,700 on donation day.

Trade Commission Acts on Salvarsan Patent.—The Federal Trade Commission has entered orders for licenses to three firms to manufacture and sell arsphenamine, the product heretofore known under the trade name of salvarsan, patent rights to which have been held by German subjects. The orders for licensees are subject to acceptance and agreement by the licenses to the stipulations made by the commission. On such acceptance and agreement, these licenses will be formally granted by Secretary L. L. Bracken, acting for the commission. The three firms licensed to manufacture and sell arsphenamine are Dermatological Research Laboratories of Philadelphia; Takamine Laboratory, Inc., of New York, and Herman A. Metz Laboratory of New York. While the price of the product is not at this time fixed by the commission, the right to fix prices is retained, and a price of $1 per dose to the Army and Navy, $1.25 per dose for hospitals, and $1.50 per dose for physicians, are the prices at which some, at least, of the licensees have stated that they intend to offer the licensed drug. The trade commission's action was taken under Section 10 of the Trading With the Enemy Act under direction of Commissioner Fort, on recommendation of C. H. McDonald, Edward S. Rogers and Francis Phelps, in charge of granting such licenses. The Public Health Service has prepared rules and standards for the manufacture and testing of arsphenamine, and will supervise its manufacture, authority having been conferred on the Public Health Service by the Secretary of the Treasury, and the observance of the rules and standards become a condition of the license.

FOREIGN

Sixty Years of Medical Practice.—The profession in Holland recently celebrated the sixtieth anniversary of the entrance into practice of one of their leading physicians, R. Krul of 's-Gravenhage. He has published a number of works on medical history and other subjects. His first work, in 1881, was on the evils of quackery.

Deaths in the Profession Abroad.—Rt. Hon. Sir **Leander Starr Jameson,** Bart., M.R.C.S. (Eng.); M.B., B.S. (Lond.), 1875; L.S.A. (Lond.), 1876; M.D., University of London, 1877; aged 64; formerly of Kimberly, South Africa; who as Dr. Jameson led the raid from Cape Colony into the Transvaal in 1895; died at his home in London, November 28. Dr. Jameson began his South African career as administrator of Rhodesia, British South Africa in 1891; four years later he led the raid into the Transvaal, took part in the battle of Kugersdorp, and surrendered to the Boers, the whole transaction occupying only four days. After his release he was indicted and tried in London, and sentenced to imprisonment for ten months, but was released after seven months on account of ill health. He returned to South Africa, and in 1900 was elected member of the Cape Legislative Assembly for Kimberly. In the same year he was appointed director of the DeBeers Consolidated Company, and two years later of the British South African Company. In 1904 he was made Premier of Cape Colony and served in this capacity until his retirement. Then he returned to London.——**A. Ballori,** a prominent alienist of Rome, aged 70, was recently killed by a homicidal paranoiac. He escaped a similar attack made by a patient, a few years ago, when one of the nurses sprang in front of the physician and received the fatal injury.——**J. Peyrot,** agrégé professor of surgery at the University of Paris and senator, aged 74.——**F. C. Barraza,** professor of organic chemistry at the University of Buenos Aires, and assistant professor of ophthalmology, aged about 55.

British Minister of Public Health.—Our London correspondent has from time to time referred to the proposition of creating a minister of public health, which means a position in the cabinet. According to an Associated Press dispatch for December 4, this has culminated in the appointment of Sir Christopher Addison, M. P., minister of reconstruction, to this position. According to the newspapers, he "hopes to carry a bill through parliament before Christmas forming a new ministry to operate a scheme of 'revolutionary character.'

This scheme is said to aim at the nationalization of the medical profession, involving free medical attendance for every one without charge. Premier Lloyd George, the *Express* adds, says the time is ripe for such a change." Sir Christopher Addison has been in the public eye for many years. He graduated from the University of London in 1893; he has been lecturer on anatomy at St. Bartholomew's Hospital; examiner of anatomy in the Universities of Cambridge and London; a member of the Faculty of Medicine, chairman of the Board of Intermediate Medical Study, and member of the Board of Human Anatomy and Morphology of the University of London; has served as secretary of the Anatomical Society of Great Britain and Ireland, as professor in anatomy in University College, Sheffield, and as editor of the *Quarterly Medical Journal*. He is the author of monographs on "The Pancreas and Adjoining Viscera," "Topographical Anatomy of the Abdominal Viscera and Especially the Gastro-Intestinal Canal in Man," and many other brochures on the subject of anatomy, and is joint author with Major Jennings of the book entitled, "With the Abyssinians in Somaliland," which appeared in 1905. Since 1910 Sir Christopher Addison has been a member of parliament from the Hoxton District of Shoreditch, and more recently parliamentary secretary of the board of education, and undersecretary of state, ministry of munitions.

PARIS LETTER

PARIS, Nov. 8, 1917.

The War

COMPASS LOCALIZER FOR THE EXACT DETERMINATION OF THE DEPTH OF PROJECTILES

At a recent session of the Académie de médecine, M. Nemirovsky exhibited a new apparatus for localizing a projectile in a few minutes without making any measurements, calculations or diagrams, thus eliminating the most frequent sources of error. A rod index indicates the exact position of the projectile. The compass is used with the roentgen rays and, by means of an ingenious attachment, can be adapted to any screen. It is based on the method of the double image; the first is supplied by the standard ray, the second proceeding from the tube moved along a trifle. The localization can be made a few minutes before the operation because it is not necessary (as in the case of other compasses) to make the radioscopic test to disclose the approximate position of the projectile. It is easy and simple to adjust, and the results obtained are exact. During the operation, the compass guides the operator to the foreign body, no matter what route of approach is chosen. It permits, besides, the localization of many projectiles and their extraction with the same apparatus at the same time. The apparatus being firm and solid cannot get out of order, neither during the sterilization, nor during the operation, and the rods are interchangeable, numbered and graduated.

SURGICAL TREATMENT OF STUBBORN REFLEX CONTRACTURES OF THE EXTREMITIES

At one of the recent meetings of the Société de chirurgie de Paris, Dr. Le Fort of Lille read a paper on this subject which can be summarized as follows: Reflex contractures, in the great majority of cases, are amenable to medical treatment. They have a tendency to cure themselves, as a rule, and hysterical reflex contractures occur often. Psychotherapy, isolation and physiotherapy are the basis of all treatment. But certain severe and stubborn forms may lead to fibrous contractures and definite disability, and in these exceptional cases, surgery can and should intervene. Tenotomy is indicated, but it is often followed by a recurrence. In the intractable cases, arthrodesis can be done as a last resource. The peripheral sympathectomy of Leriche gives very good results when vasomotor disturbances predominate; it acts only indirectly on the muscular contractures. Excision of the cicatrix, the origin of the reflex trouble, can be attempted when the cicatrix is imperfect or painful and when complete excision is possible. Resection of the sensory nerve trunks is an excellent procedure, when anesthesia of these trunks by means of cocain relieves the contracture. When this is inapplicable, when all other methods have failed, when the condition is very grave and the patient accepts the risk of a serious operation, an experienced surgeon may, perhaps, in a few cases, and only when all these conditions are fulfilled, attempt the resection of one or two posterior roots, corresponding to the zone of the cicatrix, if such resection can, as for the lumbar and sacral nerves, be made outside of the investing dural sheath.

THE HEMATOLOGIC INDICATIONS FOR IMMEDIATE TRANSFUSION SOON AFTER A WAR WOUND

Drs. Depage and Govaerts (of the Belgian army), at one of the recent meetings of the Société de chirurgie de Paris, showed that one can make a diagnosis of a possibly fatal hemorrhage immediately after the patient has been wounded. Experience has shown that if the number of red blood cells in the venous blood is notably diminished, if less than 4,000,000 in the first six hours, the prognosis is nearly always fatal. In such cases, the injection of artificial serum is useless; consequently, blood transfusion is an absolute indication. These principles apply solely to cases of wounds of the extremities. With wounds of the viscera, the red cell count is influenced by many factors, and the interpretation of a blood analysis is always difficult. The above figures apply only to healthy adults, which soldiers usually are. Under these conditions, one can, by taking cognizance of the time elapsed since the occurrence of the injury, consider as evidence of an extremely grave hemorrhage, hence a positive indication for immediate transfusion, the following counts: Less than 4,500,000 in the first three hours, less than 4,000,000 in the first eight hours, and less than 3,500,000 in the first twelve hours. Depage and Govaerts have practiced systematic blood transfusion in cases of wounds of the extremities where blood examination, based on these principles, has demonstrated the existence of grave hemorrhage. Among fourteen patients, three died of a subacute infection (gas gangrene, *Bacillus perfringens* septicemia). It is evident, then, that when an infection is in the course of development during the first few hours after the wounding, transfusion is unable to save the life of the patient. Among the remaining eleven cases in which there was no subacute infection, eight were completely successful. Of the three failures, one was due to hemoglobinuria, and in the other two it can only be surmised that the transfusion of one-half liter of blood was insufficient. In certain cases, therefore, it will be necessary to inject, not one-half liter, but a whole liter of blood. For that purpose one may make use of two donors, having first made sure that their blood is not reciprocally agglutinable.

The immediate effect of the transfusion is most remarkable, very different from that which follows the injection of artificial serum. In some cases the result is truly astonishing. The patient, previously unconscious, seems to revive, the mucous membranes resume their color, and there is every evidence of a great change for the better in the condition of the patient. The blood pressure rises immediately, and this improvement is permanent. If the blood pressure drops within a few hours, it is a sign of a subacute infection for which, unfortunately, we have no remedy at the present time. A blood count made a few days later shows that the injected red blood corpuscles are not destroyed, that is, if one has taken precautions against agglutination. The anemia present is like that following moderate hemorrhage. The red blood cell count is never lower than 2,500,000. It seems, then, that great progress can be realized, thanks to this early detection of hemorrhages, sufficiently serious to menace life. If the blood count shows that the hemorrhage of itself will be fatal, then transfusion is an absolute indication. Transfusion can be done under the most simple technic without any danger to the donor, and proves a life-saving measure for patients irremediably doomed were it not for this heroic treatment.

Marriages

LIEUT. CHARLES GERALD LAROCCO, M. R. C., U. S. Army, Cleveland, to Miss Marie L. Kelley, both of Cleveland, in St. Louis, November 18.

LIEUT. WILLIAM CHRISTIAN JENSEN, M. R. C., U. S. Army, to Miss Myrtle R. Hatch, both of Worcester, Mass., at Oak Park, Ill., November 29.

ALFRED JAMES LEARY, M.D., Newton, Mass., to Miss Helen M. Howard of Portsmouth, N. H., November 21.

CHARLES LEROY ZIMMERMAN, M.D., White Eagle, Okla., to Miss Edna Robbins of Oklahoma, recently.

CHARLES L. SEITZ, M.D., Evansville, Ind., to Miss Arnia Lloyd of Shelbyville, Ind., November 19.

FRANCIS PETER BOYD, M.D., to Miss Margaret H. Shea, both of Springfield, Mass., November 22.

HERBERT ROGERS ETHERIDGE, M.D., to Miss Courtenay Arps, both of Norfolk, Va., November 21.

Deaths

Thomas Freeman Moses, M.D., Waltham, Mass.; Jefferson Medical College, 1861; aged 81; acting assistant surgeon, U. S. Army, during the Civil War; a Fellow of the American Academy of Medicine; from 1870 to 1894, a professor in the Urbana (Ohio) University, and for eighteen years president of the institution; died at his home, November 21.

Levi Pickett Esslinger, M.D., New Market, Ala.; University of Alabama, Mobile, 1903; aged 42; formerly a Fellow of the American Medical Association; a member of the Medical Association of the State of Alabama; a specialist on diseases of the eye, ear, nose and throat; died in a hospital in Nashville, Tenn., August 6, from gastric ulcer.

James William Koontz, M.D., Greenville, Ky.; Kentucky School of Medicine, Louisville, 1894; aged 47; formerly a Fellow of the American Medical Association; local surgeon for the Illinois Central System; a director of the Inter-Southern Life Insurance Company, Louisville; died in a hospital in Charleston, W. Va., November 20.

Asst. Surg. Dudley W. Queen, U. S. N. R., Temple, Texas; University of Louisville, Ky., 1912; aged 31; a member of the State Medical Association of Texas; for six months an officer of the Medical Reserve Corps of the Navy, and on duty on the U. S. Destroyer *Cassin*, which was torpedoed a few days ago; died in Ireland, November 20.

John R. Dink, M.D., Brandenburg, Ky.; Louisville (Ky.) Medical College, 1894; aged 49; a Fellow of the American Medical Association; for many years health officer of Neade County; selective draft examiner, for his district; died in St. Joseph's Infirmary, Louisville, November 17, two weeks after an operation for abscess of the brain.

Basil M. Woolley, M.D., Atlanta, Ga.; Atlanta (Ga.) Medical College, 1882; aged 82; a Confederate veteran; who was struck by an automobile, October 26; died from his injuries in the Davis-Fischer Sanitarium, Atlanta, October 28.

George William Fraker, M.D., Excelsior Springs, Mo.; University Medical College of Kansas City, 1891; Eclectic Medical University, Kansas City, 1906; aged 59; died in Wesley Hospital, Kansas City, Mo., November 8.

Eugene B. Nash, M.D., Cortland, N. Y.; Homeopathic Hospital College, Cleveland, 1874; aged 79; formerly professor of materia medica in the New York Homeopathic Medical College; died at his home, about November 6.

Simeon Cole Bradley, M.D., Nyack, N. Y.; College of Physicians and Surgeons in the City of New York, 1880; aged 62; a retired practitioner; also a graduate in pharmacy; died at his home, November 13, from heart disease.

Daniel M. Bloom, M.D., New Waterford, Ohio; Eclectic Medical Institute, Cincinnati, 1875; aged 64; formerly a member of the Ohio State Medical Association; died in his office, October 26, from heart disease.

James Nelson Harris, M.D., Chicago; Indiana Medical College, Indianapolis, 1907; a Fellow of the American Medical Association; a colored practitioner; was shot and killed in his office by his fiancée, November 15.

Charles Watson Snyder, M.D., Clyde, Mich.; College of Physicians and Surgeons, Chicago, 1903; aged 37; a Fellow of the American Medical Association; died at his home, November 15, from nephritis.

William O. Benson, M.D., Milford, Ind.; Hering Medical College, Chicago, 1900; aged 48; formerly a member of the Indiana State Medical Association; died at his home, November 11, from pneumonia.

Abraham Philip Fetherolf, M.D., Allentown, Pa.; Bellevue Hospital Medical College, 1865; aged 74; surgeon to the Lehigh Hospital and Sanitarium, Allentown; died at his home, November 19.

D. Howard Johnston, M.D., Philadelphia; Hahnemann Medical College, Philadelphia, 1883; a member of the Medical Society of the State of Pennsylvania; died at his home, November 9.

John H. Sloan, M.D., Sante Fe, N. M.; Cincinnati College of Medicine and Surgery, 1881; aged 65; formerly a member of the New Mexico Medical Society; died at his home, November 15.

William S. Deutsch, M.D., St. Louis; Missouri Medical College, St. Louis, 1892; aged 46; a Fellow of the American Medical Association; died at his home, October 9, from diabetes.

George W. White, M.D., Canon City, Colo.; Medical College of Ohio, Cincinnati, 1868; aged 72; died at his ranch on Cottonwood Creek, about 30 miles from Canon City, November 10.

Honoré Joseph Coté, M.D., Boston; Tufts College Medical School, Boston, 1899; aged 56; a Fellow of the American Medical Association; died, November 7, from cerebral hemorrhage.

Hiram M. Tabor, M.D., Olive Hill, Ky.; Kentucky School of Medicine, Louisville, 1899; aged 50; formerly a Fellow of the American Medical Association; died at his home, November 8.

William Huber Hoffa, M.D., Benton, Pa.; Medico-Chirurgical College of Philadelphia, 1904; aged 36; coroner and sheriff of Columbia County; died at his home, November 11.

J. George Stuckey, M.D., New Philadelphia, Ohio; University of Wooster, Cleveland, 1889; aged 55; a member of the Ohio State Medical Association; died at his home, October 15.

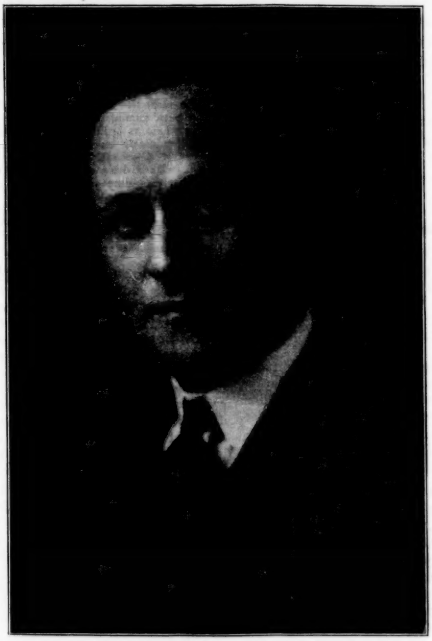
George Lindenmeyr, M.D., New York City; College of Physicians and Surgeons in the City of New York, 1888; aged 51; died at his home, November 15, from heart disease.

M. L. Withers, M.D., Wallace, Va.; College of Physicians and Surgeons, Baltimore, 1878; aged 69; died in a hospital near Richmond, Va., November 10.

Edwin G. Rummel, M.D., Butler, Ohio; Western Reserve University, Cleveland, 1898; aged 45; died at his home, November 14, from pneumonia.

Albert Monroe Wortman, M.D., Baltimore; Washington University, St. Louis, 1873; aged 65; died at his home, November 12, from diabetes.

Leonidas B. Martin, M.D., Peoria, Ill.; Rush Medical College, 1868; aged 72; died at his home, November 2.



Died in the Service
MAJOR RICHARD WEIL, M. R. C., U. S. ARMY, 1876-1917
(See The Journal, last week, p. 1899)

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

NOSTRUMS IN RETROSPECT

A Review of Worthless or Unscientific Proprietary Mixtures Previously Criticized

[FOREWORD.—The article that follows is the second[1] of a series written primarily for the purpose of reviewing the findings of the Council on Pharmacy and Chemistry on certain unscientific or worthless proprietary mixtures. Although the preparations which will be taken up in this series have been extensively dealt with in previous reports, the fact that they are still widely advertised and sold indicates the need of further publicity. The series is written by a man who is thoroughly conversant with the work of the Council on Pharmacy and Chemistry and can speak authoritatively on questions dealing with the actions of drugs in the treatment of disease.]

[ARTICLE II]

ANASARCIN AND ANEDEMIN

By S. Q. Lapius, M.D.

"Anasarcin" and "Anedemin" are the twin nostrums of cardiac pseudotherapy. They are dubbed "twin nostrums" not so much because of any similarity in their formulas, that being a minor consideration in the average nostrum, but because of the close similarity in their methods of exploitation, the therapeutic claims made for them, and the time and place of their birth.

It may be remembered that they both claim Winchester, Tenn., as their birth-place, and they appeared on the market at about the same time; furthermore, a comparison of the claims formerly made for both of them indicated that one mind conceived the main idea that lies back of their exploitation. While Anasarcin is especially dealt with in this article, much of the discussion applies with equal force to Anedemin.

A LUSH FIELD FOR NOSTRUMS

Cardiac disease, with its resultant renal involvement, is frequently encountered; and running, as it does, a chronic course, it offers an almost ideal field of exploitation for the typical nostrum vendor. By a typical nostrum vendor we mean one whose knowledge of his product is far below that of his appreciation of a certain element of human character. On this element rests the whole secret of the nostrum vendor's success. It is variously termed credulity, gullibility and child-like simplicity, but it is that which often causes even the most conscientious clinician to turn aside from the use of the best known and most dependable drugs at his command, in the face of disappointment and failure, and employ some vaunted mixture which in his saner moments he scorns to use.

Anedemin is said to consist of a "Scientific Combination of three of the more recently investigated members of the Digitalis Series, with Sambucus." That is, of apocynum, strophanthus and squill with elder. It is difficult to know just what idea it is intended to convey by the statement that it is a "scientific combination" of these drugs, for it is unscientific to mix three drugs of this group for use in fixed proportion in a wide range of conditions, if indeed, there is ever any indication for their use.

The great disadvantages of strophanthus and apocynum pertain to the extreme uncertainty of their absorption from the gastro-intestinal tract. Strophanthus is occasionally absorbed promptly, sometimes so slowly that the therapeutic effects are not induced until an amount equal to several times that which would prove fatal if all of it were absorbed into the circulation has been administered, and unfortunately, one cannot control the absorption which may continue until a fatal effect is induced. This is true to an even greater degree of apocynum, and it was due to the recognition of this fact that apocynum was not admitted to the U. S. P. IX, the Committee on dosage having agreed that no safe and effective dose could be given.

THE COUNCIL'S PREVIOUS FINDINGS

In 1907 the Council on Pharmacy and Chemistry examined the literature used in the exploitation of Anasarcin and Anedemin and published its report. Anasarcin tablets, it was pointed out, were said to contain the active principles of *Oxydendron arboreum* (sour wood), *Sambucus canadensis* (elder) and *Urginea scilla* (squill), and the following claims were made for the nostrum:

"Does what dropsy medicaments have hitherto failed to accomplish."
"Superior to digitalis, strophanthus, scoparius, squills, acetate of potash and the hydragogue cathartics all put together."
"The only known relief and permanent cure of dropsies."
"Unrivaled heart tonic."
"The most powerful agent known."
"Safe in administration."
"Non-toxic as ordinarily administered."
"Will nauseate some persons," but "the reaction from the temporary depression is prompt."
"In Bright's disease, both the interstitial and parenchymatous forms of nephritis, acute or chronic, no remedy . . . to equal it in efficacy."
"Without increasing the debility of the patient or interfering with nutrition by producing loss of appetite . . ."
"This treatment is to be continued without cessation until all symptoms of dropsy have disappeared."

A comparison of the earlier claims with those now being made (see advertisement reproduced from the *New York Medical Journal*) illustrates one of the results of the work of the Council. Today the nostrum exploiter avoids the cruder forms of obvious misstatement, but continues to make, by inference, claims that are equally misleading. It will be observed in this case that a more cautious pen worded the later advertisement, but there is still evident the intent to convince the reader that Anasarcin is superior to the official drugs in the treatment of cardiovascular diseases. The facts are that Anasarcin is at best a dangerous remedy in the hands of the average clinician in the treatment of such conditions, and its use is at all times to be condemned.

No competent investigator has ever investigated the pharmacology of sour wood (*Oxydendron arboreum*), and it appears to have no therapeutic value other than that due to a slight acidulousness. Elder (*Sambucus canadensis*) contains a trace of a volatile oil as its most important constituent, according to the British Pharmaceutical Codex of 1911 (p. 908), but it is difficult to explain why a trace of volatile oil should be considered important. Elder may be dismissed without further consideration in connection with Anasarcin tablets.

THE PHARMACOLOGY OF SQUILL

This leaves only squill among the constituents of Anasarcin for consideration. Sollmann (Manual of Pharmacology, 1917, p. 409) in discussing the advantages claimed for squill over other drugs of the digitalis group, says: "Dixon, 1906, points out that any superiority is outweighed by its disadvantages: uncertain absorption; strong gastro-intestinal irritation." Squill was formerly used as expectorant and diuretic, the activity having been attributed to two amorphous glucosids, scillipicrin and scillitoxin, but Ewins, 1911, found these to be impure mixtures. A later investigator claimed to have isolated two glucosidal agents from squill, but similar claims have often been made only to be disproved later, and we know of no confirmation of the claims regarding the isolation of any pure principles from squill having any true typical digitalis action.

The statement quoted from Sollmann is accepted by practically all pharmacologists, and we may say with certainty that squill is decidedly inferior to digitalis in the treatment of cardiovascular, and cardiorenal diseases, and certainly

1. The first article dealt with "Bell-Ans" ("Papayans-Bell") and appeared in THE JOURNAL, Nov. 24, 1917, p. 1815.

no active principles of squill were known to the scientific world at a time that the remarkable claims were first made for Anasarcin by an obscure pharmacist of Winchester, Tenn. Indeed, if Anasarcin were all that it was claimed to be, its discovery would have made Winchester as famous as a certain Wisconsin city was said to have been made by a popular beverage.

It has been abundantly demonstrated, and it is now almost universally accepted among well informed pharmacologists and clinicians, that all digitalis principles exert the same kind of action on the heart after they enter the circulation in effective doses, though they differ to an extraordinary degree in the intensity of their action and in their undesired side-actions such as nausea and vomiting. When the use of Anasarcin (squill) is followed by immediate improvement after digitalis has failed it merely shows that the dosage of digitalis was insufficient or that it was discontinued and the squill mixture was substituted before the full therapeutic effects of the digitalis developed.

WHEN THE DIGITALIS GROUP IS CONTRAINDICATED

If the administration of a sufficient dose of digitalis is not followed by improvement in the circulation it shows that the heart is incapable of responding to such treatment and the further use of any of the drugs of this group is distinctly contraindicated. This is confirmed by the experience of nearly every competent observer of digitalis therapy, and numerous fatalities have resulted from the failure to appreciate this fact and further administer some other member of the group, such as strophanthus or squill.

It is now well known that the cardiac effects of toxic doses of squill, and other members of the group, resemble closely those of cardiac disease, and it is often impossible to determine whether the behavior of the heart in a given case is attributable to insufficient dosage, to excessive dosage, or to the progress of the cardiac disease itself. If this occurs when one uses the best known members of the group it is certain that it occurs even more frequently when others that are less understood, are employed. In the light of this knowledge of the dangers attending the incautious use of any member of the digitalis group, and more especially the use of impure principles, such as are commonly obtained from squill, it is impossible to condemn sufficiently the recommendation that the use of Anasarcin should be continued without cessation until all symptoms of dropsy have disappeared.

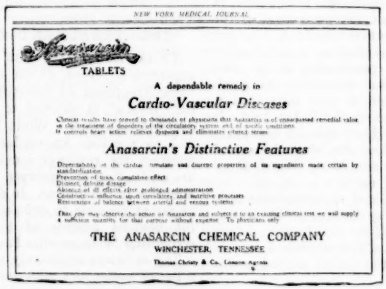
Digitalis bodies are not suited for the treatment of all cardiac disturbances, and it is, of course, self-evident that a time must come in the treatment of chronic cardiac disease when the heart is incapable of responding to any form of treatment with improvement. But, unfortunately, it never loses its response to toxic doses, and to push the administration of any drug or mixture containing any drug of the entire digitalis group—and especially those, like squill, in which the side actions are most prominent—beyond the point of tolerance is to court certain disaster.

THE TREATMENT OF CARDIAC DROPSY

While it is quite certain that many lives have been sacrificed to the failure to understand this phase of cardiac therapy, it is equally certain that many lives have been sacrificed because of insufficient dosage, and one can steer a safe course between these dangers only by using the best known preparation available, and in the present state of our knowledge it is indisputable that digitalis and the tincture of digitalis are best suited for the treatment of cardiac disease except in those few cases in which intramuscular or intravenous administration must be employed temporarily for immediate effect.

The secret of prescribing successfully for the relief of dropsy in cardiac disease consists in understanding the effects of digitalis on the heart, in administering it until these effects indicate that the desired object has been obtained, and stopping, or interrupting, the administration at that point until the effects begin to wear off. Cumulation, so called, is a positive advantage in such cases. It merely means that the desired therapeutic effects once induced persist for a time, and that further medication is unnecessary during such persistence of action. Eggleston has recently shown (*Arch. Int. Med.*, July, 1915, p. 1; abstr., THE JOURNAL, July 31, 1915, p. 459) that the full therapeutic effects of digitalis can be induced in suitable cases within a few hours even with oral administration.

We are not aware of a single publication in which a careful detailed clinical study of Anasarcin has been reported. The claims made for Anasarcin, past and present, indicate either a deliberate purpose to mislead or crass ignorance of the rudiments of pharmacology and therapeutics. The exploiters of the nostrum claim that thousands of physicians have found Anasarcin tablets of unsurpassed remedial value in the treatment of disorders of the circulatory system and of ascitic conditions.[2] It must be admitted that too many physicians have prescribed Anasarcin, otherwise the manufacturers would not have continued to spend thousands of dollars in advertising it in medical journals during a period of more than ten years.


NEW YORK MEDICAL JOURNAL

Anasarcin
TABLETS

A dependable remedy in

Cardio-Vascular Diseases

Clinical results have proved to thousands of physicians that Anasarcin is of unsurpassed remedial value in the treatment of disorders of the circulatory system and of ascitic conditions
It controls heart action relieves dyspnoea and eliminates effected serum

Anasarcin's Distinctive Features

Dependability of the cardiac stimulant and diuretic properties of its ingredients made certain by standardization
Prevention of toxic cumulative effect
Absence of gastric irritation
Adaptable to all effects after prolonged administration
Constructive influence upon circulatory and nutritive processes
Restoration of balance between arterial and venous tensions

That you may observe the action of Anasarcin and subject it to an exacting clinical test we will supply a sufficient quantity for that purpose without expense To physicians only

THE ANASARCIN CHEMICAL COMPANY
WINCHESTER, TENNESSEE
Thomas Christy & Co., London Agents

Doctor, this article is meant to be a candid discussion with you, whether you use Anasarcin or not, because every clinician is vitally interested in the customs that obtain in the practice of medicine, and we wish to put a hypothetical question to you. Answer it, at least to yourself, in exactly the spirit in which it is put. Suppose that you prescribe Anasarcin for a patient who is critically ill with cardiac disease. He dies. Are you willing to tell the relatives frankly just what you used and the nature of the evidence on which you based your choice of this nostrum? Let the supposition be carried further and say that the case was hopeless, and agree that digitalis and all other drugs would have been equally ineffective. Granting all this, would your explanation satisfy? Would you in all candor dare to offer such an explanation? Try it as a hypothetical case before you are forced to apply it.

2. Former estimates of the number of physicians who prescribed Anasarcin appear to have been too high, possibly based on the ratio obtaining in Winchester, Tenn. Inquiry at five fairly busy drug stores in a large eastern city showed that in no instance was the pharmacist even acquainted with the name. One pretended to be, and manifested pity for the enquirer's ignorance in supposing that it could be imported during the war! He was obviously merely less honest than the others, who frankly admitted they had never heard of it.

Alternating Method of Exterminating Mosquitoes.—The two Sergents, who have contributed much to tropical medicine, recently presented to the Académie des Sciences at Paris a report on what they call the alternating breeding-place method. They state that as the larvae of mosquitoes require about three weeks in water before the larvae develop into perfect winged insects, by diverting the water away, leaving the area without standing water, the stranded larvae will die off. The larvae deposited in the diverted water can likewise be killed off by diverting the water back again into its primary place. By thus alternating, week by week, the breeding places, the mosquitoes get no chance to develop, while the expense of this alternate draining may be minimal in comparison with the expense of oiling large areas of water, etc.

Correspondence

THE CARREL-DAKIN TREATMENT

[Dr. Welch and Dr. Bevan request the publication of the following letter, which is a reply to the one appearing in THE JOURNAL, November 17, page 1727. A reply by Dr. A. T. McCormack is postponed till next week through lack of space.—ED.]

Dear Bevan:—Thank you for your letter about the Carrel treatment of wounds, in which I am much interested.

I had the opportunity a year ago at Compiègne to observe the method and results of this treatment, and was most favorably impressed, as every one who has been there is. There can be no question that Carrel deserves the credit—and a very considerable credit this is—of recalling the attention of surgeons to the possibility of the sterilization of infected wounds by chemical means. The idea is, of course, not new, but is the original listerian one. That the Carrel-Dakin procedure actually accomplishes such sterilization sufficiently for surgical purposes is quite conclusively demonstrated, and whatever changes be made in his technic as the result of further experiences, he will deserve the credit of reapplying a great surgical principle of wound treatment, which had been practically abandoned, just as Lister will always have the credit of introducing the principles of antisepsis, though his technic be abandoned.

I was particularly interested when at Compiègne in following the Carrel method of bacteriologic control of the flora in the wound. I studied the smears made day by day from the wounds. These smears at first gave information concerning the numbers, and to a considerable extent also, the kinds of bacteria present. It was fascinating to watch the reduction, often astonishingly rapid, at other times slower, of these bacteria under the irrigation by the Dakin fluid. It was a quite novel thing to find the bacteriologist occupying this relation to the surgeon and telling him when the wound could be safely closed. The cicatrization after closure under this bacterial control was amazingly rapid.

The only other place where the Carrel treatment was consistently and correctly applied was by Depage at La Panne, which I did not visit, but I was told the results were admirable. Hutchinson returned from La Panne when I was in Paris, and was about to introduce the Carrel method at the American Ambulance at Neuilly.

Undoubtedly the technic of the Carrel treatment is elaborate and requires an intelligence and skill on the part of the surgeon which cannot be counted on for the average surgeon. The preparation of the Dakin solution also requires chemical skill. There are certainly difficulties in carrying out the Carrel treatment under the condition of actual warfare, and opinions may differ as to the extent of its applicability under these conditions; but this does not alter the fact that Carrel has made a very important contribution to the subject of wound treatment, and that surgeons should acquaint themselves with the principles and technic, and try to overcome the difficulties of applying the treatment as widely as possible.

I am not at all in sympathy with Sherman's efforts to have the treatment made obligatory or to have the Surgeon-General order this or any other method of treatment as the only correct procedure. There is not the slightest danger of any such thing happening. I am, of course, in sympathy with every effort looking to earlier treatment of wounds received at the front than was customary in the earlier stages of the war, and probably many wounds could be promptly closed which now are allowed to become badly infected, and thus the field for the Carrel treatment would be narrowed.

I see no conflict with the teachings of surgical pathology in Carrel's work. Of course, the cells and fluids must be relied on to take care of invading bacteria, and Almroth Wright felt, as you seem to feel, that what Carrel was aiming to do—destroy bacteria on the surface of wounds—was unimportant compared with reliance on the cellular defenses. Experience with the Carrel method, however, proves conclusively that the destruction of these surface bacteria without injury to the body tissues is of primary importance. So many who discuss this question seem to lose sight of the fact that a great principle is really involved, viz., that of the sterilization of wounds by chemical methods without damage to cells, and the influence of such sterilization on the repair of wounds. Carrel's work is fundamental on this point.

I understand that the Germans have taken over the Carrel method of wound treatment and are applying it most successfully. It would be melancholy to repeat the experience with Lister, who, discredited in his own country by all the surgeons, was taken up in Germany and his principles were there established so that his country had to accept him. I wish that you could have been at Compiègne and could have seen the actual results. These are quite unequaled, as Almroth Wright himself told me, and as so many have testified. We have enough in the way of control by other methods, I think, to justify this statement.

I visited Blake, whose great work is not in the line of wound treatment, but in the treatment of fractures. Halsted has been using the Carrel method in suitable cases for a long time, for over a year, and is most enthusiastic over it, but seems to feel that not many surgeons will master it.

Of course, much has appeared in the newspapers which is exaggerated and deplorable, and this is calculated to create a prejudice against Carrel; but I do not think that he is responsible for this.

WILLIAM H. WELCH, M.D., Baltimore.

"THE TREATMENT OF INFECTED WOUNDS"

To the Editor:—In THE JOURNAL, Nov. 10, 1917, p. 1645, appeared a review of the book by Carrel and Dehelly on "The Treatment of Infected Wounds." The larger part of the "review" is devoted to adverse criticism of statements ascribed to myself. While I am in no way responsible and had no previous knowledge of the matter in the book in question, the reviewer indulges in so many statements that are misleading or incorrect, that I deem it desirable to draw attention to the matter. In doing so, I wish to confine myself as far as possible to definite questions of fact, believing that the obvious animus of the reviewer will be adequately recognized by those who have interest in such matters.

The reviewer apparently regards it as fair play to record a list of antiseptics with which I have worked and to attach to them fantastic names which do not appear in the book nor have ever been employed by me, but which he apparently derives from advertising matter with which I have no connection in any way. He then proceeds to state, "Yet in all these 'discoveries' the potent agent has always been active chlorin (positively charged chlorin [Cl^+]), the same substance with which the medical profession has had well tried experience when employing calcium hypochlorite (bleaching powder) and the much abused solution of chlorinated soda (Labarraque's solution)." This statement is disingenuous and misleading. That "active chlorin" was contained in the substances is not surprising, since that was the object avowedly sought; but that positively charged chlorin ions, Cl^+, are the active agent in each case is a gratuitous assumption without a shred of evidence. As a matter of fact, hypochlorite solutions appear to ionize mainly to ClO^- ions. That the chloramins dissociate differently is evident from the fact that while the hypochlorites bleach indigo solutions, the former do not. Moreover, their reactions with many other substances, including proteins, are often quantitatively and qualitatively different. The suggestion that Cl^+ ions are the active agents in all the chlorin antiseptics is as without basis as the assumption of the equivalence of white arsenic and salvarsan. If any one imagines that the various chlorin antiseptics are chemically equivalent, he will be speedily disillusioned if he perform the simple experiment of putting pieces of any animal tissue in the solutions and observing the result.

The reviewer states that "the authors uphold Dakin's claim that this solution . . . is isotonic with the blood." As a matter of fact, I have never made such a claim, and have always known the solution to be hypertonic.

The reviewer states that "Dakin's solution is *not* neutral, but is alkaline, and should be alkaline when prepared in the manner described." My actual statement is as follows: "The solution is acid to phenolphthalein suspended in water, but *still alkaline to litmus.*"

Commenting on the use of phenolphthalein in aqueous suspension instead of in solution, the reviewer states, "It is, indeed, surprising that phenolphthalein should thus be used when every student in elementary analysis is taught that it is not reliable in such conditions." This statement is absolutely incorrect so far as the testing of hypochlorite solutions is concerned. Apparently the reviewer is unaware of the fact that hypochlorites react with the ordinary solutions of phenolphthalein to give chlorinated products and alkaline caustic soda, thus giving false indications of alkalinity. The use of phenolphthalein suspensions in water for testing the reaction of hypochlorite solutions has occasioned no difficulty in the hands of even inexperienced workers, and undoubtedly serves to avert the use of highly irritating solutions.

The reviewer, in contesting the approximate neutrality of the solutions, makes the following naive comment: "If to some of Dakin's solution alkali be added, and the solution then tested by phenolphthalein, it will still give the 'neutral' reaction." It has apparently escaped the notice of the reviewer that this condition was deliberately sought. The use of a balanced solution of hypochlorite containing "buffer salts" (bicarbonates or borates) was purposely chosen because such solutions "are able to retain their essential neutrality even after the addition of limited quantities of acid or alkali." It will, of course, be recalled that exact neutrality is an ideal and unobtainable condition, and that in everyday usage a solution is said to react acid, alkaline or neutral simply with regard to some arbitrarily chosen indicator.

Finally, may I add a word of personal explanation. No one deplores more than I do the ludicrous exaggerations of the daily press as to the utility of the solution which has become associated with my name. As a matter of fact, in none of my own writings in scientific journals have I coupled my own name with the solution, but have simply described the preparation as an approximately neutral sodium hypochlorite. In December, 1915, I wrote, "It would seem as if the time had come for a statement to the effect that what we have all been striving for is to find the best means of preparing, preserving and applying the powerful antiseptics, hypochlorites and hypochlorous acid, the main properties of which substances were discovered by distinguished French chemists many generations ago." So far as the hypochlorites are concerned, this is as true now as then.

H. D. DAKIN, New York.

COMMENT OF THE REVIEWER.—I regret that Dr. Dakin has made it necessary to deny any personal animus in my review of "The Treatment of Infected Wounds," by Carrel and Dehelly. What criticisms were made were made solely for scientific reasons.

Dr. Dakin places an unusual interpretation on my statement, "Yet in all these 'discoveries,' the potent agent has always been active chlorin (positively charged chlorin [Cl^+]). . . ." Contending that the statement is disingenuous and misleading, Dr. Dakin says: "That 'active chlorin' . . . was the object avowedly sought, but that positively charged chlorin ions, Cl^+, are the active agent in each case is a gratuitous assumption without a shred of evidence." In other words, Dr. Dakin differentiates between active chlorin and positively charged chlorin (*atoms, not ions.* The term *ion* was not used in the review). This is quite contrary to present day concepts. According to modern chemistry, oxidation may "be considered to involve ultimately the assumption of positive, or the loss of negative electrical charges by ions or atoms" and defined "as consisting fundamentally in the *loss of electrons by atoms or ions*" (Stieglitz: Qualitative Chemical Analysis, The Century Company, 1911, Part I, page 252). Thus hypochlorous acid [(Cl^+OH), which, besides ionizing into H^+ and ClO^- dissociates into Cl^+ and OH^-], hypobromous acid (Br^+OH), hypoiodous acid (I^+OH) *and their derivatives* have as a common characteristic an atom with an unstable positive charge and a tendency to convert this atom into the common, stable, negative variety (Stieglitz and Senior, *Jour. Am. Chem. Soc.*, 1916, **38,** 2727), and therefore are *active* oxidizing agents. There is also convincing evidence to show that the chloramins (described by Dr. Dakin) contain positively charged chlorin as in the case of hypochlorite: (1) The formulas described by Dakin and methods of preparation (the replacing of a hydrogen atom of an amido group by chlorin) strongly suggest that the chlorin is positively charged. (2) On hydrolysis, they yield hypochlorous acid. (3) They are *active* oxidizing agents. I believe that if Dr. Dakin will consider these points, along with the classic researches of W. A. Noyes, Julius Stieglitz, Harry Shipley Fry, Lauder W. Jones and others, he will be convinced that I did not err.

In referring to the "isotonicity" of the Dakin-Daufresne solution ("Neutral" Solution of Chlorinated Soda, N. N. R.), I inadvertently had in mind an article by Daufresne, instead of Dakin. In this article (Daufresne, Maurice: L'hypochlorite de soude chirurgical. Différence entre la solution de Dakin et celle de Labarraque, *Presse méd.*, Oct. 23, 1916, p. 475), Daufresne states that "elle est sensiblement isotonique au sérum sanguin" ("it is perceptibly isotonic to blood serum"). I am sorry that this statement was attributed to Dr. Dakin; it happened, undoubtedly, because of the close association that has existed between the names of Daufresne and Dakin in their mutual work. However, so far as I am aware, this is the first time Dr. Dakin has publicly admitted the hypertonicity of the solution.

When I commented on the use of phenolphthalein, I did not have reference to its use as a solid instead of in solution. My contention was and is that phenolphthalein is "not reliable in such conditions," i. e., in the presence of *bicarbonates* and *hypochlorites.* The assertions in the review concerning the fallacy of the phenolphthalein indicator were made advisedly as a result of both theoretical considerations and a number of experiments. Dr. Dakin himself states that "hypochlorites react with ordinary solutions of phenolphthalein to give chlorinated products and alkaline caustic soda, thus giving false indications of alkalinity." This statement is in accord with my contentions, as, of course, phenolphthalein is only an indicator when in solution, whether it be added as such or "dusted" on as a powder. Furthermore, when we speak of neutrality, it should be understood that the neutrality is closely comparable to that of water. Dakin's solution does not have such neutrality, but is distinctly alkaline, part proof of which is the evidence offered by Dr. Dakin that it is *"alkaline to litmus."* Even under normal conditions, litmus is a more reliable indicator of alkalinity than phenolphthalein. Dr. Dakin's definition of neutrality would seem to be rather hazy, especially when, in the condition employed, the indicator is unreliable. The sooner writers will recognize that a solution is really neutral when the concentration of the H and OH ions is the same as exists in water, the sooner will there be less confusion in medical chemistry.

Dr. Dakin states that in none of his writings in scientific journals has he coupled his name with the solution. It might not be amiss to quote from page 23 of the recent "Handbook of Antiseptics" by Dakin and Dunham: "Neutral Sodium Hypochlorite Solution ('Dakin's Solution')."

THE REVIEWER.

"THE HANDICAP OF PROPRIETORSHIP IN MEDICINE"

To the Editor:—The article in THE JOURNAL, November 24, page 1818, with this title does us a gross injustice, and in reply thereto we beg leave to submit the following:

For reasons which every publisher (yourself included) understands, it is not practicable for us to reproduce in full, in the columns of *Therapeutic Notes,* all the clinical papers to which we wish to direct the attention of our readers. But that the article of Dr. Mundell was not garbled to make capital for Parke, Davis & Co. is quite apparent on comparison of the omitted portions with a previous paper by the same author reprinted in the January (1917) issue of the *Notes,* and herewith submitted together with clippings from

other issues of the *Notes* which prove that we have not hesitated to present to our readers the dangers incidental to the misuse of Pituitrin as well as the advantages of its proper use.

Therapeutic Notes, in quoting other journals, puts into its readers' hands the means of investigating the fairness of its quotations. It is a house organ—true enough; but the organ of a house which has always appealed to the honor as well as to the progressiveness of the medical profession. Its publishers could not afford to resort to deception in advertising their products through this or any other medium.

The profession is indebted to Parke, Davis & Co. for Pituitrin (among other medicaments), and it is to the profession that the manufacturers look for the ultimate verdict. The contraindications are quite as important as the indications, and, as the excerpts submitted show, we have taken account of these, not only in forming our own estimate, but in presenting the evidence to the readers of *Therapeutic Notes*.

We cite these facts that you may give us a square deal in an early issue of THE JOURNAL if so disposed.

PARKE, DAVIS & Co., Detroit.

[COMMENT.—THE JOURNAL has no desire to discuss Parke, Davis and Company's motives in omitting certain parts of Dr. Mundell's paper. What THE JOURNAL did was to publish those parts of Dr. Mundell's paper on the "Present Status of Pituitary Extract in Labor" that Parke, Davis and Company left out of their circular. That it is not practicable, as Parke, Davis and Company points out, for the manufacturers of proprietary products to reproduce in full all clinical papers dealing with such products is obvious. It is not so obvious why such concerns in abstracting or quoting papers of this kind should delete those parts that are unfavorable to the products dealt with rather than those that are favorable. Curiously, however, whenever an author is quoted only in part those parts are almost invariably those favorable to the product.—ED.]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

NO DRAFT OF MEN OVER 31 YEARS OF AGE

To the Editor:—1. I should like to know whether medical men (over the present draft age of 31 years) are to be drafted now or whether there is any possibility that this will be the case after the first of the year.

2. If the new draft age limit (from 18 to 45) is passed by Congress, will they take men from "country practices" where there is only one physician? My reason for wishing to know this is that if there is to be this necessity I should rather enlist than wait until the last and be drafted.

S. E. L.

ANSWER.—1. Under the present law, neither physicians nor other men over 31 years of age come within the selective service.

2. It is impossible to predict what may occur under new laws which may be passed until after these laws are passed. There is nothing in the present selective service law or in the regulations which would permit a special drafting of the medical profession.

TOEING IN

To the Editor:—What should I do, if anything, for a 2 year old child who "toes in" to an unpleasant extent when walking, although when standing he keeps the feet straight? The legs are well developed and are straight. He has had no illness except measles, and is in sturdy health. Is it worth while to apply braces, or will this fault correct itself in time?

W. J. W.

ANSWER.—A slight degree of toeing in is entirely natural, and indicates a strong foot. It is much to be preferred to a "toeing out" gait. Sometimes, however, it is present in an exaggerated degree; in such cases the trouble can be easily remedied by the use of a straight lasted shoe with a lift of one-fourth or three-eighths inch put under the outside of the sole. Great care must be taken that the shoes are sufficiently long. The empty space inside the shoe should extend at least one-fourth inch beyond the ends of the toes. It will be found that the heel will wear off unevenly on one side, and this should be kept squared up and not allowed to run over.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 8. Chairman, Dr. S. W. Welch, Montgomery.

COLORADO: Denver, Jan. 8. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DELAWARE: Wilmington, Dec. 11-13. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

DISTRICT OF COLUMBIA: Washington, Jan. 8. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

HAWAII: Honolulu, Jan. 10-13. Sec., Dr. G. A. Batten, Box 375, Honolulu.

INDIANA: Indianapolis, Jan. 8-10. Sec., Dr. Wm. T. Gott, 84 State House, Indianapolis.

MARYLAND: Baltimore, Dec. 11. Sec., Dr. J. McP. Scott, 137 W. Washington St., Hagerstown.

MINNESOTA: St. Paul, Jan. 2-4. Sec., Dr. Thomas McDavitt, 741 Lowry Bldg., St. Paul.

MISSOURI: St. Louis, Dec. 17-19. Sec., Dr. George H. Jones, 206 Washington St., Jefferson City.

NATIONAL BOARD OF MEDICAL EXAMINERS: New York City, Jan. 9-17. Sec., Dr. J. S. Rodman, 310 Real Estate Bldg., Broad and Chestnut Sts., Philadelphia.

NEW HAMPSHIRE: Concord, Dec. 10-12. Sec., Dr. W. T. Crosby, Beacon Bldg., Manchester.

NEW MEXICO: Sante Fe, Jan. 14. Sec., Dr. R. K. McClanahan, East Las Vegas.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, Grand Forks.

OKLAHOMA: Oklahoma City, Jan. 8-9. Sec., Dr. J. J. Williams, Weatherford.

OREGON: Portland, Jan. 1. Sec., Dr. Herbert S. Nichols, Portland.

PENNSYLVANIA: Philadelphia, Jan. 8-10. Sec., Nathan C. Schaeffer, State Capitol, Harrisburg.

RHODE ISLAND: Providence, Jan. 3. Sec., Dr. B. U. Richards, State House, Providence.

SOUTH DAKOTA: Pierre, Jan. 8. Sec., Dr. P. B. Jenkins, Waubay.

UTAH: Salt Lake City, Jan. 7-8. Cor. Sec., Dr. G. F. Harding, 407 Templeton Bldg., Salt Lake City.

VIRGINIA: Richmond, Dec. 11-14. Sec., Dr. J. W. Preston, McBain Bldg., Roanoke.

WASHINGTON: Spokane, Jan. 1. Sec., Dr. C. N. Suttner, Baker Bldg., Walla Walla.

WISCONSIN: Madison, Jan. 14. Sec., Dr. J. M. Dodd, 220 E. Second St., Ashland.

Maine March Examination

Dr. Frank W. Searle, secretary of the Maine Board of Registration of Medicine, reports the written and practical examination held at Portland, March 13-14, 1917. The examination covered 9 subjects and included 90 questions. An average of 75 per cent. was required to pass. Five candidates were examined, all of whom passed. Three candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Loyola University		(1916)	79
Bowdoin Medical School		(1916)	78
Tufts College Medical School		(1909) 82; (1915)	83
McGill University		(1916)	92

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Dartmouth Medical School		(1891)	New Hamp.
Cincinnati College of Medicine and Surgery		(1900)	Ohio
University of Vermont		(1912)	Vermont

Alabama July Examination

Dr. S. W. Welch, chairman of the Alabama State Board of Medical Examiners, reports the written examination held at Montgomery, July 9-13, 1917. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Forty-four candidates were examined, of whom 32 passed and 12 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Birmingham Medical College		(1915)	76.3, 79.2
University of Alabama	(1917) 75.9, 77.3, 77.8, 79, 79.4, 79.5, 80, 81.3, 84.1, 84.2, 84.2, 85.4.		
Atlanta Medical College	(1916) 77.2; (1917) 78, 83.8, 84.8.		
Chicago College of Medicine and Surgery		(1916)	75.4
Loyola University		(1916)	75.9
University of Louisville		(1916)	84.5
Tulane University of Louisiana		(1909) 76.8; (1917)	76.3, 76.8
Johns Hopkins University		(1917)	85.6
Columbia University		(1916)	87.8
Jefferson Medical College		(1916) 85.5; (1917)	81.8
Meharry Medical College		(1917)	75.2
University of Nashville		(1892)	75.3
Vanderbilt University		(1917)	75
University of Virginia		(1917)	80.6

FAILED

Birmingham Medical College (1914) 69, 72.1; (1915) 55.6, 60.1, 72.9.		
North Carolina Medical College	(1917)	69.5
University of Oklahoma	(1914)	72.6
Jefferson Medical College	(1884)	70.9
Meharry Medical College	(1914)	61.3
Memphis Hospital Medical College	(1899) 69.5; (1912)	69.1
University of Tennessee	(1915)	69.6

Book Notices

PRACTICAL MATERIA MEDICA AND PRESCRIPTION WRITING, WITH ILLUSTRATIONS. By Oscar W. Bethea, M.D., Ph.G., F.C.S., Assistant Professor of Materia Medica and Instructor in Prescription Writing, Tulane University of Louisiana. Second Edition. Cloth. Price, $4.50 net. Pp. 562. Philadelphia: F. A. Davis Company, 1917.

THE PRESCRIPTION THERAPEUTICALLY, PHARMACEUTICALLY, GRAMMATICALLY AND HISTORICALLY CONSIDERED. By Otto A. Wall, Ph.G., M.D., Professor of Materia Medica, Pharmacognosy and Botany in the St. Louis College of Pharmacy. Fourth Edition. Cloth. Price, $2.50. Pp. 274, with illustrations. St. Louis: C. V. Mosby Company, 1917.

PHARMACY, THEORETICAL AND PRACTICAL, INCLUDING ARITHMETIC OF PHARMACY. By Edsel A. Ruddiman, Pharm.M., M.D., Professor of Pharmacy and Materia Medica, Department of Pharmacy, Vanderbilt University. Cloth. Price, $1.75 net. Pp. 267. New York: John Wiley & Sons, 1917.

The first edition of the volume by Bethea was reviewed in THE JOURNAL, Nov. 6, 1915, p. 1667, when the purposes of the book and the general treatment of the subject were described. In the second edition the book has been brought up to date, especially with reference to drugs in the United States Pharmacopeia. New ones have been added, and many dropped, "with a sigh of relief," it is said. In addition to naming all of the pharmacopeial preparations and describing many of them, prescriptions are given which illustrate the manner in which these are advantageously prescribed. Errors and incompatibilities are pointed out. There are clinical and general indexes. Attention might be called to a few errors in proofreading of the names of drugs and chemical formulas, and to the frequent occurrence of the split infinitive and other defects of style which have not been eliminated from this edition. Attention is properly directed by the author to the undesirability of the habit of prescribing proprietary drugs, but it is to be noted with reference to prescription writing, that after giving the Latin terminations of many drugs the author says: "They are always abbreviated, so it is suggested that a study of terminations is not necessary." This is a bad suggestion, as is the one that the prescriptions given in the book are in perfect form to be copied and sent to the duggist, a method of prescribing which should not be encouraged.

Leaving out the section on materia medica, Wall's book covers much the same ground in the matter of prescription writing, with examples, etc., as the book by Bethea, but it is more extended. Most interesting is the history, which it gives, of prescription writing from its beginning in ancient days. The author upholds process patents on proprietary drugs, and the specification of the products of a certain manufacturer in a prescription.

Ruddiman has given interesting, practical and useful statements of things the practicing pharmacist should know, but adapted more especially to the use of students. His book is intended to be supplementary to the information gained from the Pharmacopeia and the National Formulary.

EXAMINATION OF WATER, CHEMICAL AND BACTERIOLOGICAL. By William P. Mason, Professor of Chemistry, Rensselaer Polytechnic Insitute. Fifth Edition. Cloth. Price, $1.25. Pp. 186, with illustrations. New York: John Wiley & Sons, 1917.

In this new edition of a well known laboratory guide, there has been little change in the chemical analyses described; but the tests for "relative stability," free chlorin, and lime and soda values have been added. The bacteriologic methods have been rewritten to conform to the latest edition of "Standard Methods." Unfortunately the normal chlorin maps referred to in the text have been omitted. The illustrations have been materially improved over those in former editions. Amplification of Appendix A, discussing the interpretation of a water examination, would greatly increase the usefulness of the book for elementary students.

Medicolegal

When Right of Appeal to Courts Obtains

(Brown vs. Harris County Medical Society et al. (Tex.), 194 S. W. R. 1179)

The Court of Civil Appeals of Texas, in reversing a judgment that dismissed the plaintiff's application for injunctive relief against expulsion from the defendant society, says that the trial court sustained a general demurrer to the plaintiff's petition, and on his declining to amend the same, dismissed his suit on the ground that it appeared from the petition that the plaintiff had the right to appeal to the board of councilors of the state association, from the proceeding of the defendant society, and that such appeal made provision for adequate relief. The cause having been disposed of by demurrer, this court was not advised, nor was the trial court advised, otherwise than by the allegations of the plaintiff's petition, as to what provision was made for the trial and expulsion of the members of the defendant society, by its by-laws and rules. Therefore the court is unable to say whether or not the plaintiff was tried and convicted in accordance with the by-laws and rules of the association, or whether or not the appeal provided for would have afforded adequate relief, unless the court does know that in his petition the plaintiff alleged that he was tried on charges presented on the night on which he was tried and convicted; that he had no notice or knowledge of the existence of such charges until after he had presented his defense; and that this trial on such charges was contrary to and in violation of the by-laws and rules of the association. The court also knows that the plaintiff alleged in his petition that the provisions for appeal made by the association were wholly inapplicable and inadequate, and would not afford him any relief for the alleged unlawful conviction and expulsion. If the allegations of the plaintiff's petition were true, he had the right to resort to a court of equity for relief, and the trial court erred in holding to the contrary and dismissing his suit on demurrer; in other words, if the plaintiff's allegation that the board of councilors, the appellate body, had no power to review and reverse the action of the local society, in expelling the plaintiff, in the event they should find that he was not tried in accordance with the by-laws and rules of the association, was true, the appeal provided by the association was inadequate and would not furnish the plaintiff relief from such unlawful conviction and expulsion, and in such case he had the right to resort to the courts for relief. The trial court should have overruled the general demurrer, and have heard evidence as to the facts alleged with reference to the rules of the association governing appeals, and in the event the facts alleged were established, the court should have gone further and heard evidence as to whether the plaintiff was tried and expelled in accordance with the by-laws and rules of said association. It is well settled that where an association under its rules expels a member, such member must resort to, and must exhaust, the remedies provided by the association itself, through its constitution and by-laws, before applying to a court of equity for relief. But this court has found no authority for holding that where a member of a voluntary association has been convicted of an offense and expelled in violation of the rules and by-laws of the association, and where the by-laws and other laws of the association do not allow adequate relief by appeal from such conviction and expulsion, such member may not resort to a court of equity for relief. The court thinks the uniform holding of all courts is to the contrary.

Society Proceedings

American Association of Anatomists, Minneapolis, Dec. 27-29.
American Physiological Society, Minneapolis, Dec. 27-29.
Porto Rico Medical Association, San Juan, Dec. 22-23.
Society of American Bacteriologists, Washington, D. C., Dec. 27-29.
Western Surgical Association, Omaha, Dec. 14-15.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York Pa.

November, LXXVI, No. 5

1 *Fundal Hysterectomy to Reduce Menstruating Surface. G. K. Dickinson, Jersey City, N. J.—p. 740.
2 *Physical Conditions in Women Warranting Sterilization. E. W. Hedges, Plainfield, N. J.—p. 745.
3 *Prolapse of Uterus. C. L. Bonifeld, Cincinnati.—p. 750.
4 *Operative Treatment of Procidentia. A. T. Jones, Providence, R. I.—p. 752.
5 Cervical Lacerations; Their Significance for Patient. F. Reder, St. Louis.—p. 756.
6 *Acute Dilatation of Uterus; Report of Cases. N. S. Scott, Cleveland.—p. 763.
7 *Carcinoma Occurring in Stump of Cervix, Following Suprapubic Hysterectomy; Report of Cases. E. A. Vander Veer, Albany, N. Y.—p. 771.
8 *Recurrences After "Five-Year Period" in Carcinoma of Cervix. X. O. Werder, Pittsburgh.—p. 776.
9 Radium; Report of Cases. D. C. Moriarta, Saratoga Springs, N. Y.—p. 781.
10 *Mixed Cell Tumor of Kidney Weighing Three Pounds in Infant Ten Months Old. W. E. Darnall, Atlantic City, N. J.—p. 786.
11 *Etiologic Study of Vulvar Carcinoma. F. J. Taussig, St. Louis.—p. 794.
12 Case of Pseudohermaphroditism. H. D. Purdum, Sykesville, Md.—p. 813.
13 Primary Carcinoma of Liver in Childhood; Report of Case. J. Forman, Columbus and J. S. Hattery, Manfield, Ohio.—p. 862.

1—4. Abstracted in THE JOURNAL, Oct. 13, 1917, pp. 1293 and 1294.

6. Abstracted in THE JOURNAL, Oct. 20, 1917, p. 1377.

7. **Carcinoma of Cervix.**—About sixty-five cases of this kind are now on record. Vander Veer points out that because carcinoma of the cervix does occur in a few cases following suprapubic hysterectomy, it is not a point in favor of a panhysterectomy exclusively. The dangers of a panhysterectomy are greater than the risk of a carcinoma occuring secondarily in the cervical stump and being promptly treated. A careful examination should be made of every cervix before the hysterectomy is performed, particularly in women who have borne children. In every case of hysterectomy, the patient should be advised to report promptly if there is any appearance of a vaginal discharge, a curettment done, and a laboratory examination made. Removal of the cervix per vaginam is certainly to be perferred to opening the abdomen in every case in which the disease has not progressed too far, as well as in cases having any discharge. Routine pathologic examination of the myomatous uterus at the time of operation should be done, and in this way unsuspected cases of carcinoma of the uterus, also of the cervix, will be discovered and the proper operation then performed.

8. Abstracted in THE JOURNAL, Oct. 27, 1917, p. 1466.

10. Abstracted in THE JOURNAL, Oct. 20, 1917, p. 1378.

11. **Study of Vulvar Carcinoma.**—The fifteen observations of vulvar cancer made by Taussig illustrate the great malignancy of cancer in younger individuals. Of special interest was the fact that of the five whose age was under 45 years, two had had operations that brought on artificial menopause and these two were by far the most malignant in this series. Previous pregnancies would not seem to be a factor in their development, for six of the fifteen women had had no children and three of them had never been married. The inguinal or femoral lymph glands were involved with certainty in nine of the fifteen women. Only one of these nine women is at present living and this one was operated on only four months ago so that the probability is that she also will die of a recurrence. Taussig says that the fact that no cancer was found in the lymph glands in some of these cases by no means proves that a small nest of cancer cells was not tucked away in some unexamined portion of the tissue removed. Clinical experience shows that in almost every case of vulvar cancer, even in the earliest stages the lymph glands are involved. Even after radical removal of the lymph glands with the vulvar mass, the chance for a reappearance of the cancer in the glandular system is three times greater than is the local recurrence.

American Journal of Orthopedic Surgery, Boston

November, XV, No. 11

14 Volkmann's Contracture: Interstitial Myositis; Report of Cases. A. Steindler, Iowa City, Iowa.—p. 741.
15 The 1916 Maryland Epidemic of Infantile Paralysis. R. T. Taylor, Baltimore.—p. 759.
16 Subperiosteal Fissure Fractures of Tibia in Children; Report of Cases. S. Kleinberg, New York.—p. 764.
17 Combined Medical and Postural Examination of Seven Hundred and Forty-Six Young Adults. L. T. Brown, Boston.—p. 774.
18 Orthopedic Innersole for Shoes. H. W. Marshall, Boston.—p. 788.

Annals of Surgery, Philadelphia

November, LXVI, No. 5

19 *Treatment of Staphylococcus Septicemia by Transfusion of Immune Blood. R. S. Hooker, New York.—p. 513.
20 *Persistence of Bacteria within Sequestrums. K. Taylor and M. Davies, Paris.—p. 522.
21 *Case of Diabetes Insipidus as Sequel to Gunshot Wound of Head. E. A. Graham, Mason City, Iowa.—p. 529.
22 *Traumatic Brachial Paralysis with Flail Shoulder Joint; Report of Fourteen Cases. T. T. Thomas, Philadelphia.—p. 532.
23 Case of Myxofibromas of Abdominal Wall. K. S. J. Hohlen, Lincoln, Nebr.—p. 555.
24 Two Cases of Gallstones in Infancy and Childhood. D. N. Eisendrath, Chicago.—p. 557.
25 Four Kinds of Appendicitis. R. T. Morris, New York.—p. 560.
26 *Enterostomy and Use of Omentum in Prevention and Healing of Fistula. C. H. Mayo, Rochester, Minn.—p. 568.
27 Histopathology of Twenty-Six Cases of Carcinoma of Testicle. S. H. Geist and W. Thalhimer, New York.—p. 571.
28 University Hospital Shoulder Splint. S. Pope, San Francisco.—p. 581.
29 *Evaluation of Asepsis and Antisepsis. W. F. Fowler, Rochester, N. Y.—p. 583.

19. **Treatment of Septicemia by Transfusion.**—Five cases of transfusion of immune blood for staphylococcus infection are reported and analyzed by Hooker. In four the donors were immunized. The results obtained are decidedly in favor of the efficacy of immunized blood transfusion in chronic staphylococcus septicemias, and especially in those which complicate bone conditions. In this class of cases there is usually ample time to prepare a suitable donor by administration of vaccines, but if the anemia is pronounced no time should be lost in performing a preliminary transfusion of normal blood. In the acute infections, early blood cultures and an immediate start to immunize a donor are of the utmost importance. If urgent, it is best not to wait for full immunization but to give the first transfusion even after one dose of vaccines. If the patient has a fairly good blood volume with a high bacterial blood content, there should be no hesitation in removing a considerable amount of blood by venesection just before transfusion.

20. **Bacteria Within Sequestrums.**—In about 90 per cent. of the specimens of bone examined histologically by Taylor and Davies bacteria were seen lying well within the substance of the sequestrum, usually in nests within the canals or cell spaces. The organisms were recovered more frequently from the sequestrum than from the wound, suggesting a richer flora within the former. One point, however, is especially evident, and that is the greater incidence of the anaerobic group within the sequestrum. Gas-forming anaerobes developed nearly four times more often from the bone than from the wound, while spores were present six times more often. In no case were gas or spore-producing anaerobes recovered from the wound when not recovered from the sequestrum removed from it. The bone itself appears to be the most common site for the persistence of the anaerobic flora. Anaerobic bacilli are probably active factors in the disintegration of sequestrums within the wound. Anaerobic bacilli within the dead bone appear to be associated with the occurrence of "flares" after operations on bones. Flares occurred more frequently after sequestrectomy when the cases were over 120 days old than when the cases were under that age. The authors believe that it is probably impossible to kill by antiseptic treatment the bacteria within the dead bone. The object of treatment must be to remove this focus of infection. The sequestrums may be extracted by operation, or their dis-

appearance hastened by utilizing the solvent action of acid dressing solutions. The persistence of bacteria within the bone probably explains the infection which often follows bone grafts in old compound fractures, and indicates the advisability of postponing that operation as long as practicable.

21. **Diabetes Insipidus After Head Wound.**—Graham's case is of interest because it seems to bring additional support to the idea that diabetes insipidus is an expression of a disturbance of function of the hypophysis or its neighboring tissue.

22. **Traumatic Brachial Paralysis.**—The purpose of this paper is to confirm, by further clinical experience, the conclusion reached six years ago on this phase of traumatic brachial paralysis, that is, that the flail shoulder joint is the result of a dislocation and is essentially the cause and not the result of the paralysis. This is shown by the fact that the early operative removal of the flail shoulder results in a cure of the paralysis. If the paralysis and flail shoulder had been caused by a rupture of the brachial plexus, recovery would not have followed, uniformly, treatment restricted to the shoulder joint. According to Thomas's experience, in most cases of traumatic brachial paralysis the shoulder joint is not in the least flail, but on the contrary exhibits limited movement and pain when movement is made. In view of the large number of cases of obstetric palsy reported, hundreds of them in recent years, Thomas is inclined to doubt its occurrence. If it does not occur it then becomes necessary for those who account for the obstetric paralyses by an injury of the brachial plexus to explain the absence of flail shoulder in this class of cases.

26. **Enterostomy in Healing of Fistula.**—Mayo proceeds as follows: A low-lying loop of distended bowel is elevated into the incision. A segment is freed of gases or fluids and controlled by rubber-covered forceps applied above and below mesentery a purse-string suture of silk is applied in a diameter of half an inch. The bowel is perforated in the center of the point selected for perforation. At a point opposite the the purse string by a knife or cautery. A catheter, size 10 or 12, is inserted several inches into the intestine and held in place after the purse string is tied, by perforating its side with the same needle and tying it into place. Two successive purse-string sutures may be applied by the Stamm-Kader method, but the procedure most satisfactory is that of Witzel, that is, depressing the catheter into the wall of the bowel and suturing together the folds thus formed over the catheter for a space of an inch and a quarter. When the operation is made as a jejunostomy for feeding or for intestinal obstruction in children the Coffey method of incising the peritoneal and muscular layers of the bowel at the point of depressing the catheter into its wall conserves the lumen of the intestine, the tube being placed between the mucosa and the wall of the intestine, and the peritoneum and muscle being approximated over the catheter. This method is rarely followed by a fistula. For additional security and also to favor closure of the opening, pass the catheter through the perforated omentum and then for fixation include the parietal peritoneum, the omentum and the intestine in three sutures. This method maintains a movable, even if adherent, intestine and the omental graft aids in closing the bowel opening by granulation.

29. **Evaluation of Asepsis and Antisepsis.**—Fowler's investigation of the value of various antiseptics and methods of antisepsis discloses abundant clinical evidence of the efficacy of iodin in skin sterilization, this evidence being corroborated by laboratory findings; the germicidal action of mercuric chlorid is too slow to be of value in sterilization of the skin. Eternal vigilance is the price of asepsis.

Archives of Internal Medicine, Chicago

November, XX, No. 5

30 *Renal Function in Gout. C. W. McClure, Boston.—p. 641.
31 Amyotonia Congenita of Oppenheim: Report of Six Cases, Full Review of Literature. M. S. Reuben, New York.—p. 657.
32 Diagnostic Signs from Scaleni, Intercostal Muscles and Diaphragm in Lung Ventilation. C. F. Hoover, Cleveland.—p. 701.
33 Serum Changes Following Protein "Shock" Therapy. W. F. Petersen, Chicago.—p. 716.
34 *Ventricular Fibrillation in Man with Cardiac Recovery. G. C. Robinson and J. F. Bredeck, St. Louis.—p. 725.
35 Localized and Interlobar Pneumothorax Complicating Pulmonary Tuberculosis; Report of Cases. M. Fishberg, New York.—p. 739.
36 Studies on Blood Sugar. L. Hamman and I. I. Hirschman, Baltimore.—p. 761.
37 Kidney Function in Diabetes Mellitus. R. Fitz, New York.—p. 809.

30. **Renal Function in Gout.**—McClure is of the opinion that the apparently frequent occurrence of decreased renal function in cases of typical gout justifies a word of caution against assuming that the faulty excretion of uric acid and of other nitrogenous substances when found is due to derangements in metabolism. The gouty kidney is often functionally deficient, hence the faulty elimination of exogenous uric acid and of other nitrogenous substances by gouty persons may be the result of depression of the functional power of the kidneys. While renal retention explains many of the anomalies occurring in the excretion of uric acid and of other nitrogenous substances in gout, nevertheless this does not explain the nature of gout, nor does it preclude the possibility of there being an underlying perversion of metabolism. The purpose of this discussion has been to emphasize the facts that (1) many of the findings which have heretofore been considered due to disturbances of nuclein metabolism in gout may be explained as the result of renal inadequacy, and (2) that the theories concerning the etiology of gout remain hypotheses without satisfactory experimental bases.

34. **Ventricular Fibrillation in Man with Cardiac Recovery.**—A case is reported by Robinson and Bredeck in which the patient showed marked cardiac insufficiency and had three attacks of cardiac syncope. During one of these attacks an electrocardiogram was obtained which is typical of ventricular fibrillation. The patient lived thirty hours after this syncopal attack, and numerous electrocardiograms were obtained during this time. One immediately after the intravenous injection of strophanthin showed a deranged cardiac mechanism similar to that observed experimentally by Levy and Lewis during the so-called state of potential fibrillation. The abnormal forms of ventricular complex which occurred frequently, were such as to indicate that there was a derangement of intraventricular conductivity. This may have been the prime factor in the production of the ventricular fibrillation. The occurrence of ventricular complexes indicative of derangement of intraventricular conductivity should be taken as contraindication for the use of drugs such as chloroform, epinephrin and strophanthin, which predispose the heart to ventricular fibrillation. The foregoing case is the first example of cardiac recovery from well established ventricular fibrillation that has been observed in man.

Archives of Ophthalmology, New Rochelle, N. Y.

November, XLVI, No. 6

38 Antigenic Properties of Uveal Tissue as Shown by Complement Fixation. A. C. Woods, Philadelphia.—p. 503.
39 Case of Aneurysm of Internal Carotid Artery (Intracranial Portion) and Its Effect on Patient's Vision. J. R. Shannon, New York.—p. 518.
40 Supernumerary Orbital Muscles. C. C. Rush and J. P. Schaeffer, Philadelphia.—p. 524.
41 Case of Total Loss of Vision in One Eye and Partial Loss in Other Completely Relieved by Sellar Decompression Operation. W. R. Parker, Detroit.—p. 528.
42 Case of Hemorrhage into Optic Nerve Sheaths as Direct Extension from Diffuse Intrameningeal Hemorrhage Caused by Rupture of Aneurysm of Cerebral Artery. F. H. Doubler and S. B. Marlow, Boston.—p. 533.
43 Quantitative Perimetry; Practical Devices and Errors. C. B. Walker, Boston.—p. 537.
44 Heterochromia Iridis, Heterochromic Cyclitis and Allied Conditions. E. C. Ellett, Memphis, Mass.—p. 562.

Bulletin of Johns Hopkins Hospital, Baltimore

November, XXVIII, No. 321

45 *Histological Study of Fifty Uteri Removed at Cesarean Section. J. W. Williams, Baltimore.—p. 335.
46 *Adenomyoma of Rectovaginal Septum. T. S. Cullen, Baltimore.—p. 343.
47 *Hematomas of Ovary, Including Corpus Luteum Cysts. E. Novak, Baltimore.—p. 349.

45. **Fifty Uteri Removed at Cesarean Section.**—During the past twenty years Williams has had occasion to amputate the body of the uterus supravaginally and to treat the stump extraperitoneally in fifty cases following delivery by cesarean section. In each instance the specimen has been preserved and subjected to careful histologic examination. The study of this comparatively large material has yielded important information concerning a number of questions; more particularly concerning the mechanism of the separation of the placenta and of the fetal membranes; the amount of decidua retained immediately postpartum; the vascular changes at the placental site; the retraction of the uterine muscle; the occurrence of ascending infection in patients who had been long in labor, or who had been repeatedly examined by persons neglecting rigorous hand disinfection; and finally concerning the characteristics of the cicatrix resulting from previous sections, and its bearing on the correctness of the dictum—"Once a cesarean always a cesarean." But, Williams says, that the evidence at his disposal indicates that the healing of cesarean section wounds is generally satisfactory, provided the convalescence has been normal, and ordinarily does not call for a repetition of the procedure unless definitely indicated by the existence of extreme disproportion or some other conditions. On the other hand, in patients in whom the convalescence has been abnormal, it is probable that the cicatrix will be greatly thinned out and will offer a locus minoris resistentiae. In such cases, a repeated cesarean section may be indicated for the express purpose of avoiding a subsequent rupture. Williams' experiences, however, shows that this is not inevitable and that even should it occur, satisfactory results should follow prompt operation. For practical purposes, therefore, Williams concludes that the behavior of the cicatrix can be regarded with equanimity provided the previous convalescence has been normal, but when it has been disturbed there is a reasonable probability of the occurrence of rupture, and that such patients should be kept under the closest observation during the last months of a succeeding pregnancy.

46. Abstracted in THE JOURNAL, Aug. 5, 1916, p. 401.

47. **Hematomas of Ovary, Including Corpus Luteum Cysts.**—A careful study of the menstrual histories of the cases on which Novak's paper is based shows that the hemorrhage which cause follicular hematomas occurs characteristically at or near the supposed time of ovulation, that is, between the seventh and sixteenth days of the menstrual cycles. The bleeding of corpus luteum origin, as might be expected, occurs later, being apparently only an exaggeration of that normally occurring in the stage of vascularization. There is no characteristic menstrual history associated with the presence of hematomas in the ovary.

California State Journal of Medicine, San Francisco

November, XV, No. 11

48 Vegetative Nervous System in Relation to General Medicine. F. M. Pottenger, Monrovia.—p. 440.
49 Report of Forty-Four Appendicitis Operations in Children Under Fourteen Years of Age. E. K. Willits and M. I. Judell, San Francisco.—p. 444.
50 Intranasal Cosmetic Surgery with Special Reference to Rib with Cartilage and Cartilage Transplants. G. Selfidge, San Francisco.—p. 445.
51 Diagnosis and Treatment of Acidosis, Especially in Diabetes. A. H. Rowe, Oakland.—p. 451.
52 Etiology of Pellagra. J. E. Jennison, San Diego.—p. 456.
53 Malingering; Its Diagnosis and Significance. J. H. Catton, San Francisco.—p. 458.
54 Remote Effects of Brain Trauma. H. W. Wright, San Francisco.—p. 462.
55 Later Developments Along Immunologic Lines. R. A. Archibald, Oakland.—p. 464.

Georgia Medical Association Journal, Augusta

October, VII, No. 6

56 Early and Late Gastric Cancer as Shown by Roentgen Ray. G. M. Niles, Atlanta.—p. 109.
57 Tumors of Gums. J. L. Campbell, Atlanta.—p. 112.
58 Roentgen Examination of Stomach, Duodenum and Appendix. J. S. Derr, Atlanta.—p. 116.
59 Modern Artificial Infant Feeding—Simple, Practical and Scientific. W. A. Mulherin, Augusta.—p. 124

Illinois Medical Journal, Chicago

November, XXXII, No. 5

60 Individualization in Treatment of Surgical Inflammations. E. H. Ochsner, Chicago.—p. 305.
61 Report of Interesting Case in Its Relation to So-Called Traumatic Hernia. C. R. G. Forrester, Chicago.—p. 308.
62 Pyelocystitis in Infancy and Childhood. H. F. Helmholz, Evanston.—p. 311.
63 Importance of Nasal Affections in General Practice. N. Schoolman, Chicago.—p. 314.
64 Ileus. C. Langer, Chicago.—p. 317.
65 Some Bodily Effects of Depressing Emotions. M. Solomen, Chicago.—p. 322.
66 Nasal Dysmenorrhea and Genital Areas of Nose. L. E. Barnes, Chicago.—p. 326.
67 Points and Pointers. G. W. Nesbitt, Sycamore.—p. 330.
68 Diagnosis and Treatment of Moral Diseases. E. N. Stenn, Chicago.—p. 337.
69 Psychotherapy in Obstetrics. H. W. Long, Elmwood.—p. 339.
70 Foreigner; Prey of Medical Quacks. H. R. Krasnow, Chicago.—p. 342.
71 Asthma. R. H. Brown, Chicago.—p. 345.
72 Goiter, Diagnosis and Treatment. L. F. Watson, Chicago.—p. 350.
73 Indications for Operation in Acute Mastoid Disease. G. H. Mundt, Chicago.—p. 352.
74 Intestinal Stasis. G. B. Kelso, Bloomington.—p. 256.

Iowa State Medical Society Journal, Des Moines

November, VII, No. 11

75 Surgery of Thyroid. E. S. Judd, Rochester, Minn.—p. 403.
76 Goiter, Use and Misuse of Treatment. E. Grimes, Des Moines.—p. 407.
77 Symptoms of Acute Infectious Osteomyelitis. H. L. Beye, Iowa City.—p. 410.
78 Choice of Operation in Cholelithiasis and Chronic Cholecystitis. J. E. O'Keefe, Waterloo.—p. 412.
79 Significance of Mucous Membrane Disturbances in Upper Respiratory Tract. F. G. Murphy, Mason City.—p. 416.
80 Supervision of Public Water Supplies by Health Officer. J. J. Hinman, Jr., Iowa City.—p. 417.

Journal of Biological Chemistry, Baltimore

November, XXXII, No. 2

81 Adaptation of Winkler's Method to Biologic Work. W. J. V. Osterhout and A. R. C. Haas, Cambridge.—p. 141.
82 Diffusion of Electrolytes Through Membranes of Living Cells. Additive Effect of Salt and Base and Antagonistic Effect of Salt and Acid. J. Loeb, New York.—p. 147.
83 *Determination of Small Amounts of Calcium, Particularly in Blood. J. O. Halverson and O. Bergeim, Philadelphia.—p. 159.
84 *Calcium Content of Blood Serum in Certain Pathologic Conditions. J. O. Halverson, H. K. Mohler and O. Bergeim, Philadelphia.—p. 171.
85 *Biologic Analysis of Pellagra-Producing Diets. Minimum Requirements of Two Unidentified Dietary Factors for Maintenance as Contrasted with Growth. E. V. McCollum and N. Simmonds, Madison, Wis.—p. 181.
86 Probable Accuracy, in Whole Blood and Plasma, of Colorimetric Determinations of Creatinin and Creatin. A. Hunter and W. R. Campbell, Toronto.—p. 195.
87 *Micromethod for Determination of Calcium and Magnesium in Blood Serum. W. M. Marriott and J. Howland, Baltimore.—p. 233.
88 *Micromethod for Determination of Inorganic Phosphates in Blood Serum. W. M. Marriott and F. H. Haessler, Baltimore.—p. 241.
89 *Iron as Antidote to Cottonseed Meal Injury. W. A. Withers and F. E. Carruth, West Raleigh, N. C.—p. 245.
90 Some Factors Influencing Respiration of Ground Nervous Tissue. C. G. MacArthur and O. C. Jones, San Francisco.—p. 259.
91 Direct and Indirect Calorimetry of Cassiopea Xamachana. Effect of Stretching on Rate of Nerve Impulse. J. F. McClendon, Minneapolis.—p. 275.

83. **Determination of Calcium in Blood.**—The authors suggest the precipitation of calcium as oxalate directly in the filtrate from biologic fluids after removal of protein, the final estimation being carried out by a refinement of the permanganate titration method. In this paper is presented in greater detail the procedure which experience with this method has suggested as well as data with regard to the accuracy of estimation.

84. **Calcium Content of Blood Serum.**—Data are presented by the authors with regard to the calcium content of human blood serum in certain pathologic conditions, particularly nephritis, as well as of the blood serum of normal men. In the normal cases values lying between 9 and 11 mg. of calcium per hundred cubic centimeters were obtained. In nearly all of the pathologic conditions studied, including cases in which the blood clotted with extreme slowness, a similar range was observed, indicating a great constancy of this element in the blood serum. Distinct decreases were

noted in cases of hematogenous jaundice, eclampsia, pneumonia and particularly uremia. In several cases of uremia increases in serum calcium were noted on improvement in the clinical condition and following administration of calcium lactate. The urinary calcium excretion in severe nephritis was found to be low and calcium lactate administration brought about but slight absolute increases. In cases in which marked general edema occurred, with or without nephritis, the excretion of calcium was unaffected by increased ingestion. In a case of pernicious vomiting of pregnancy with severe acidosis, alkali administration decreased calcium excretion to 8 per cent. of its original value. It is pointed out that calcium determinations on whole blood are of little value unless the relative volume of plasma and corpuscles is known.

85. **Pellagra Producing Diets.**—McCollum and Simmonds believe that there are two deficiency diseases in the sense in which Funk employed this term. One of these is polyneuritis, which Funk recognized. This is due to a lack of an adequate supply of the unidentified water soluble B which is abundant in all natural foodstuffs but is practically absent from purified starch, polished rice, sugars, and all fats of both animal and vegetable origin. The other is a syndrome in which the two most prominent features are emaciation and xerophthalmia. Scurvy, pellagra and rickets can be accounted for by errors in the diet without assuming a protective substance for each of them.

87. **Calcium and Magnesium in Blood Serum.**—By the methods described by Marriott and Howland it is said to be possible to determine calcium and magnesium in 2 c.c. samples of serum with a maximum error of less than 5 per cent., a degree of accuracy entirely sufficient for the purposes for which the methods were devised. The methods depend on the fact that solutions of ferric thiocyanate are decolorized by oxalates and by phosphates. Calcium is precipitated as the oxalate and magnesium as the ammonium magnesium phosphate; the precipitates are dissolved in acid and added to solutions of ferric thiocyanate, the degree of decolorization resulting being determined by comparison in small Nessler tubes.

88. **Phosphates in Blood Serum.**—This method was devised by Marriott and Haessler in order to determine whether or not a retention of inorganic phosphates, with a resulting increase of these substances in the blood serum, occurs in patients suffering from certain types of nephritis. Results obtained by the use of the method in such cases have already appeared. The method depends on the decolorization of solutions of ferric thiocyanate by an acid solution of ammonium magnesium phosphate. The phosphates of the serum are precipitated directly by means of magnesia mixture.

89. **Iron as Antidote to Cottonseed Meal Injury.**—Feeding experiments with pigs showed that iron salts have a decidedly beneficial action in preventing cottonseed meal injury. Much larger quantities of meal are consumed, deaths have been postponed or averted, and better gains have been made when an iron salt is added to the feed. The suggestion is made by Withers and Carruth that the iron salts combine with, or facilitate oxidation of the harmful substances in cottonseed meal. By thus controlling the toxic factor, it is shown that cottonseed meal injury is not due to a lack of vitamins or to deficiencies in calcium, sodium and chlorin—which ash analyses might lead one to suspect as the limiting mineral factors in a diet of cottonseed meal and corn.

Maine Medical Association Journal, Portland

November, VIII, No. 4

92 Modern Anesthesia. O. E. Haney, Portland.—p. 91.

Medical Record, New York

November 17, XCII, No. 20

93 Epizootic of Poliomyelitis Among Dogs. H. Greeley, Brooklyn and W. L. Johnson, Jamaica.—p. 839.

94 Partial Thyroidectomy: Operation for Transplanting and Anchoring Remaining Lobes of Thyroid. E. V. Hubbard, New York.—p. 842.

95 Results of Treatment of Tuberculosis by Means of Bacillus Destroying Compound. (Echinacea; Inula.) V. Von Unruh, New York.—p. 847.

96 Value of Roentgenology in Head Injuries. G. W. Welton, New York.—p. 852.

97 New Suspension Method of Treatment of Infantile Paralysis. R. Bernard, Chicago.—p. 854.

98 Plea for More Cesarean Sections in Selected Cases. Thirty-Four Consecutive Cases without Mortality to Mother or Child. G. P. Coopernail, Bedford.—p. 856.

Military Surgeon, Washington, D. C.

November, XLI, No. 5

99 How Medical Services of Government May Best Cooperate in Time of War. L. A. La Garde and others.—p. 552.

100 Study of About Two Thousand Physical Examinations of Officers and Applicants for Commission Made at Army Medical School. C. H. Goddard.—p. 578.

101 Some Aeromedical Observations. R. N. Greene.—p. 589.

Modern Hospital, St. Louis

November, IX, No. 5

102 Contagious Disease Hospital for Immigrants at Ellis Island, N. Y. J. G. Wilson, New York.—p. 313.

103 Controlling Basis for Economical Use of Supplies. H. J. Moss, Baltimore.—p. 318.

104 Hospital Problem of Today—What Is It? J. A. Hornsby, Chicago. —p. 322.

105 Oil as Fuel in Institutions. J. M. Peters, Providence, R. I.—p. 328.

106 Reducing Hazard to Life in Nonfireproof Hospital Buildings. H. F. J. Porter, New York.—p. 333.

107 Publicity as a Means of Education and Support. G. D. Greene, New York.—p. 336.

108 Standardization of Hospitals—Class V, Small Semipublic Community Hospitals. J. A. Hornsby and others.—p. 341.

109 Municipal Training Schools for Nurses. C. H. Shutt, St. Louis. —p. 354.

New Jersey Medical Society Journal, Orange

November, XIV, No. 11

110 Protein Poison in Health and Disease. V. C. Vaughan, Ann Arbor, Mich.—p. 417.

111 Study of Tuberculous Lung Lesions as Revealed by Roentgen Ray Plates and Value of These in Physical Diagnosis. H. K. Dunham, Cincinnati.—p. 424.

112 Psychologic Handling of Tuberculous Patient. C. L. Minor, Asheville, N. C.—p. 427.

New York Medical Journal

November 17, CVI, No. 20

113 Roentgen Ray in Diagnosis of Pneumonia, Pleural Diseases and Pulmonary Tumors. M. Manges, New York.—p. 917.

114 Labyrinthine Vertigo and Past-Pointing. W. A. Wells, Washington, D. C.—p. 921.

115 New Conception of Arteriosclerosis. I. L. Nascher, New York. —p. 924.

116 Suprapubic Prostatectomy with Mechanical Drainage. C. W. Shropshire and C. Watterston, Birmingham, Ala.—p. 928.

117 Wassermann Reaction in Duplicate. M. Schulman, New York.—p. 929.

118 Case of Acute Erythematous Lupus. G. A. Brown, Philadelphia. —p. 931.

119 Case of Amyotrophic Lateral Sclerosis in Form of Progressively Developing Triplegia. G. B. Hassin, Chicago.—p. 932.

120 Functional Inefficiencies of Teeth Associated with Occlusal Anomalies. M. Hellman, New York.—p. 935.

Northwest Medicine, Seattle

November, XVI, No. 11

121 History of Idaho State Medical Association. E. E. Maxey, Boise, Ida.—p. 323.

122 Historical Sketch of Utah State Medical Association. W. B. Ewing, Salt Lake City.—p. 328.

123 Ocular Headache. D. H. Bell, Tacoma.—p. 331.

124 First Aid in Eye Injuries. W. D. Donoher, Salt Lake City.—p. 334.

125 Sinus Disease and Otitis Media in Epidemic Influenza. J. S. Davies, Tacoma.—p. 336.

126 Removal of Tonsils as Prophylactic Measure in All Children of Four Years of Age, Why and Now. R. W. Perry, Seattle. —p. 339.

127 Health Insurance Legislation and Specialist. R. A. Fenton, Portland, Ore.—p. 342.

128 Spina Bifida. E. O. Jones, Seattle.—p. 344.

Ohio State Medical Journal, Columbus

November, XIII, No. 11

129 Cancer of Uterus. J. F. Baldwin, Columbus.—p. 710.

130 Purpura Hemorrhagica. E. W. Mitchell, Cincinnati.—p. 712.

131 Clinical Significance of Muscular Headaches. W. Mithoefer, Cincinnati.—p. 716.

132 Treatment of Diphtheria Carriers. H. O. Ruh and others, Cleveland.—p. 719.

133 Medical License, Medical Practice and Legislation. H. Wright, Cleveland.—p. 725.

Public Health Journal, Toronto

November, VIII, No. 11

134 Social Aspects of Venereal Disease Problem. G. Bates and others, Toronto.—p. 287.
135 Technic of Bordet-Wassermann Reaction for Use in Public Health Laboratories. H. K. Detweiler, Toronto.—p. 292.
136 Military Aspect of Venereal Disease Problem in Canada. F. S. Patch, Montreal.—p. 301.
137 Plan for Instruction in Hygiene, Preliminary Medical Inspection of Students and Free Dispensary or Hospital Treatment in Canadian Universities. J. G. Fitzgerald, Toronto.—p. 304.

Tennessee State Medical Association Journal, Nashville

November, X, No. 7

138 Glaucoma. E. C. Ellett, Memphis.—p. 263.
139 Simple and Radical Mastoid Operations. H. E. Christenberry, Knoxville.—p. 271.
140 Hyperchlorhydria as Clinical Entity. G. M. Niles, Atlanta.—p. 275.
141 Curability of Syphilis. W. A. Oughterson, Nashville.—p. 279.
142 What Profession Can Do Toward Stimulating Health Work in Laity. W. Krauss, Memphis.—p. 282.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

November 3, II, No. 2966

1 *Injuries to Peripheral Nerves and Their Treatment. B. Moynihan. —p. 571.
2 *Surgical Treatment of Severe Penetrating Wounds of Chest in Casualty Clearing Station. J. Anderson.—p. 575.
3 *Surgical Treatment of Severe War Wounds of Chest. J. E. H. Roberts and J. G. Craig.—p. 576.
4 Notes in Connection with Above Articles on Surgery of Chest. H. M. W. Gray.—p. 580.
5 Plastic Transcostal Thoracotomy. E. M. Cowell.—p. 581.
6 *Early Operative Treatment of Penetrating Gunshot Wounds of Chest. F. J. Hathaway.—p. 582.
7 *Treatment of Gunshot Wounds of Elbow Joint; Plea for Primary Excision. C. M. Moullin.—p. 583.

1. **Treatment of Injuries to Peripheral Nerves.**—Moynihan summarizes his experience in this field of work as follows: The earliest examination should be made of all wounds in which division of a nerve trunk is probable. If at the casualty clearing station such a lesion is found, end-to-end suture should be adopted forthwith. This is more likely to be possible in cases in which primary suture of the wound, after excision is found practicable. If secondary suture of the wound after the Carrel-Dakin method has been practiced is to be undertaken, the union of divided nerves should be secured at the same time. If these methods have been attempted and have failed, they do not prejudice the later union of the nerve. On the contrary, they probably ensure that an easier and more satisfactory operation can then be practiced. Throughout the whole period before late nerve suture is attempted the strictest attention must be paid to the relaxation and nutrition of all paralyzed muscles, to the maintenance of suppleness in all joints moved by these muscles, and to the preservation of the integrity of the skin. Operations on nerve trunks demand the most scrupulous observance of the ritual of asepsis. There must be the greatest gentleness of manipulation; the nerve must not be injured by instruments or by the surgeon's finger; it must not be separated from its sheath or disturbed overmuch from its bed; it must not be chilled or allowed to dry. All sutures must be of fine catgut, and introduced with most punctilious accuracy. Axial rotation of the nerve must be avoided. The cut ends of the nerve before approximation must show clearly the fibers of which the trunk consists. Nerve grafting is of little or no value; nerve anastomosis is to be sharply condemned; the turning down of flaps from the nerve to bridge a wide gap is useless. Tendon transplantation is of great value in cases in which nerve suture is impossible, or has given a result not entirely satisfactory.

2. **Surgical Treatment of Wounds of Chest.**—Wounds of the chest, as seen at an advanced casualty clearing station, are classified by Anderson into two main groups from the point of view of prognosis: Group A: 1. Entrance and exit bullet wounds. 2. Entrance and exit shrapnel-ball wounds. 3. Wounds caused by small fragments of high explosive missiles. As a general rule these cases do exceedingly well if treated expectantly and aspirated or operated on when occasion demands. They can usually be evacuated to the base in from three to ten days, and the ultimate results are good. Of course, in a certain proportion of such cases there is sufficient visceral injury to cause immediate or early death, but, as they seldom reach the casualty clearing station, they do not come within the scope of this paper. Group B: 1. Wounds caused by large irregular fragments of high explosive shell which have lodged in the thorax. These are almost always associated with (*a*) clothing and infection carried in, and (*b*) open sucking wounds of the chest wall. 2. Tangential wounds of the thorax, enfilading the ribs and driving portions of bone, etc., into the pleura and lung. 3. Entrance and exit bullet wounds in which the exit wounds are explosive in character.

If treated expectantly only a very small percentage of Group B 1 reach the base, and many of those that are evacuated appear to die from the complications of their wounds. In Group B 2 and 3 the prognosis is usually not so severe, but an unduly large percentage develop an infected hemothorax unless the chest wall wound is treated energetically. In the latter group the prognosis, when no operation is performed, is always worse in wounds of parts where there is a liberal muscle covering, for example, in the scapular region. The patients in Group B usually have died hitherto at the casualty clearing station from sepsis and exhaustion, and it is this group of cases which demands more vigorous surgical intervention.

3. **Id.**—The principles Roberts and Craig have tried to follow in the treatment of chest wounds recently dealt with have been: operation at the earliest possible moment, free excision of all infected tissues, removal of the foreign body and cleansing of the pleural cavity or wound of the lung, followed by accurate suture of the lining membrane and tissues over it, whenever possible without drainage. Drainage of the pleural cavity has been employed only when one or other of these principles could not be fulfilled, for example, when a large foreign body, with infection around it, could not be removed. When anaerobic infection of the superficial muscles is present the wound is left open to an extent corresponding to the area of the infection, for example, in the case of a wound of the back when the more superficial muscles alone are infected it is possible to suture the pleura and leave the superficial part of the wound freely drained. There does not seem to be grave objection to washing out with, and possibly leaving inside the pleura, a few ounces of a nonirritating antiseptic, such as alkaline solution of sodium hypochlorite (Dakin's) or other similar solution, but the necessity for this is by no means established.

6. **Id.**—The ideal methods of modern war surgery are (1) early operation, (2) complete excision of wound and damaged tissues, (3) removal of metal fragments and clothing, (4) mechanical cleansing of wound (the use of strong antiseptics is to be avoided), and (5) complete suture of wound. Provided one can get early and complete operation, there is far more danger from secondary than from primary infection. The treatment of wounds of the chest, therefore, follows the same lines as those of the abdomen, head, knee, or other joints; they require just as early operation, and, Hathaway says, the results are just as good.

7. **Treatment of Gunshot Wounds of Elbow Joint.**—The results of primary excision of the elbow joint, according to Moullin, are wonderfully good, provided sufficient bone is removed; that is to say, the lower end of the humerus just above the level of the epicondyles, the whole of the head of the radius and the ulna at the same level. Even if the conditions are such that the wound is already infected, the drainage is so free that a serious degree of sepsis can usually be avoided, and there is not that enormous mass of callus thrown out, binding everything together and locking the fragments so that they cannot move. Owing to the necessity of reeducating the muscles of the forearm, which have been separated from their attachments, it may be twelve months before recovery is complete, but the fingers and wrist can be used after the first few weeks, and, if a suitable splint is provided, the elbow as soon as the wound is sound.

Glasgow Medical Journal

October, LXXXVIII, No. 4

8 Two Cases of Friedreich's Ataxia in Adolescents. J. Fergus.—p. 193.
9 Dissolving Senile Cataract in Early Stages. W. B. I. Pollock.—p. 208.
10 *Cases of Rupture of Uterus and Cesarean Section. J. H. Martin.—p. 214.

10. Rupture of Uterus and Cesarean Section.—Martin's first case was one of rupture of uterus in the fourth month of pregnancy. The fetus was forced between the layers of the broad ligament. Manual removal of uterine contents was performed. The second case was one of cesarean section on the second day of labor. The membranes ruptured several hours before. The outcome was a live child and recovery of the mother.

Lancet, London

November 3, II, No. 4914

11 *Use of Nitrous Oxid and Oxygen with Rebreathing in Military Surgery. H. E. G. Boyle.—p. 667.
12 Circulatory Inefficiency, with Special Reference to Nervous Factor. E. B. Gunson.—p. 670.
13 Presence of Spirochete in Urine in Cases of Trench Fever. A. T. Nankivell and C. E. Sundell.—p. 672.
14 *Operation for Repair of Crucial Ligaments. E. W. H. Groves.—p. 674.
15 *Treatment of Series of Recently Inflicted War Wounds with Proflavine. L. Colledge and others.—p. 676.
16 Rations in Relation to Disease in Mesopotamia. W. H. Willcox.—p. 677.
17 *Influence of Hypnotic Suggestion on Inflammatory Conditions. J. A. Hadfield.—p. 678.
18 Case of Epilepsy Cured by Removal of Calcareous Intracranial Tumors. T. Thompson and A. J. Walton.—p. 679.

11. Nitrous Oxid and Oxygen with Rebreathing in Military Surgery.—This paper is an attempt to procure a more extended use of gas and oxygen with regulated rebreathing in major surgical procedures, and especially in the treatment of wounded. Boyle points out that this anesthetic is nontoxic, and therefore there is less strain put on to the patient, seeing that he does not have to eliminate the drug, be it ether or chloroform, from his system. Moreover, there is no shock after gas and oxygen. However, this combination of anesthetics is not one to place in the hands of the careless or inexpert—it requires skilful administration, and if used carelessly will inevitably lead to disasters. The method is unsuited when absolute relaxation is required all the time; in some abdominal cases, for instance, gallbladder operations. There have not been any fatalities among 711 cases.

14. Repair of Crucial Ligaments.—The principle of the operation devised by Groves consists in forming a new anterior crucial ligament from the iliotibial band and a new posterior ligament from the tendon of the semitendinosus. In each case the new ligament retains its upper attachment in the thigh and is threaded through new canals bored in the femur and tibia, and is sewn to the outer surface of the latter bone.

15. War Wounds Treated with Proflavine.—As tested by the authors in the treatment of a series of recent wounds, there appear to be no differences in the properties of the two substances acriflavine and proflavine.

17. Hypnotic Suggestion.—Hadfield cites a case of blisters on the skin caused by hypnotic suggestion.

National Medical Journal, Shanghai

September, III, No. 3

19 *Differential Leukocyte Count in Beriberi. J. W. H. Chun.—p. 113.
20 Isolation of Streptococci from Rabbits. E. T. H. Tsen.—p. 116.
21 Report of Research Committee of Chinese Medical Men's Association on Height, Weight and Chest Measurements of Healthy Chinese. G. D. Whyte.—p. 111.

19. Leukocytic Count in Beriberi.—Differential leukocytic counts in forty-two cases of clinically recognized beriberi seen at the Shantung Road Hospital, Shanghai, during the year 1912 were made by Chun. The differential count published by the author as being that of a normal Chinese is as follows: finely granular oxyphil, 58.0 per cent.; coarsely granular oxyphil, 5.7 per cent.; basophil leukocyte, 0.6 per cent.; hyalin, 9.8 per cent.; and lymphocyte, 25.3 per cent. The differential count obtained in forty-two cases of beriberi was as follows: finely granular oxyphil, 57.4 per cent.; coarsely granular oxyphil, 5.2 per cent.; basophil leukocyte, 0.4 per cent.; hyalin, 19.5 per cent., and lymphocyte, 17.2 per cent. It will be noted that the hyalin cells average as high as 19.5 per cent., whereas the normal figure among the this notably high percentage of the hyalin cells may serve Chinese ought to be 9.8 per cent. The author suggests that as a help toward the diagnosis of beriberi in difficult cases.

Practitioner, London

November, XCIX, No. 5

22 Occurrence of Cleft Palate. J. E. Frazer.—p. 401.
23 Auricular Fibrillation. F. W. Price.—p. 428.
24 Heart Failure and Administration of Digitalis. H. L. Flint.—p. 443.
25 Case of Unilateral Striae Atrophicae (Striae Cutis Distensae) of Thorax, and Case of Macular Atrophy (Maculae Atrophicae). F. P. Weber.—p. 453.
26 Recent Orthopedic Surgery. V. Moxey.—p. 462.
27 Irritative States of Erector Spinae as a Cause of High Blood Pressure. E. F. Cyriax.—p. 468.
28 Internal Secretions. T. B. Scott.—p. 474.
29 Probable Causes of Fatalities at Tonsil Adenoid Operation. J. D. Mortimer.—p. 482.
30 Spirochetal Dysentery and Postspirochetal Paralysis During Epidemic of Relapsing Fever. K. Yacoub.—p. 487.

Bulletin de l'Académie de Médecine, Paris

October 16, LXXVIII, No. 40, pp. 395-434

31 The Declining Birth Rate. C. Richet, P. Bar and others.—p. 396. Continuation.
32 The Bread Card. E. Maurel.—p. 419.
33 Classification of Antiseptics. C. Richet and H. Cardot.—p. 425.
34 Intramuscular Injections in Treatment of Gonorrheal Sepsis. S. Mélamet.—p. 428.
35 Rupture of the Spine; Reduction; Recovery. Joly and Noury.—p. 430.

Paris Médical

October 13, VII, No. 41, pp. 289-304

36 Pneumococcus Infections Simulating Typhoid or Influenza. S. I. de Jong and G. Magne.—p. 289.
37 *Radiotherapy of Tuberculous Peritonitis. E. Albert-Weil.—p. 292.
38 Intoxication from Emetin. C. Mattei.—p. 295.
39 Eruption from Handling Powder from Unexploded German Shells. G. Milian.—p. 299.
40 Nervous Lesions after War Wounds of the Head. H. Gougerot.—p. 301.

37. Roentgenotherapy of Tuberculous Peritonitis.—Weil remarks that of all the various methods of treating tuberculous peritonitis that have been applied to date, systematic utilization of sunlight and sea air seem to have the most testimony in their favor. But both require the suitable environment which is within the reach of comparatively few. On the other hand, with the roentgen rays we can apply the chemical rays anywhere, even to outpatients. He has been applying roentgenotherapy systematically since 1914, using large doses of very penetrating rays, filtered. Some of the children had the fibrous form of peritonitis and some the form with ascites. In every case in which there was not already generalization of the disease in the lungs or pronounced cachexia, a complete cure was rapidly realized, with complete restoration of the general health. He uses a Coolidge tube, a 5 mm. aluminum filter, a 20 cm. spark, and a 1.5 or 2 milliampere current. The exposures are repeated about monthly, but he reduces the strength a little each time to ward off skin trouble. This technic does not entail radiodermatitis nor generalization of the tuberculosis. After the first series there may be a recrudescence of the fever and persisting malaise, but this reaction was never serious in his experience, and he never allowed it to interfere with his giving the effectual dose of 12 or 14 H units in the course of four successive days on the four quarters of the abdomen. In case of much debility the series can be fractioned to spread out over ten or twelve days.

Presse Médicale, Paris

September 27, XXV, No. 54, pp. 561-568

41 *Ankylosis of the Ankle-Joint. Ducroquet.—p. 561.
42 Rabies in Man; Three Cases. H. G. de Cardenal, Legrand and Benoit.—p. 564.
43 White Patches on the Nail. (Les ongles marbrés.) R. Sabouraud.—p. 566.

October 4, No. 55, pp. 569-576

44 *Test Tachycardia after Exertion. C. Aubertin.—p. 569.
45 *Improvised Mask for Anesthetics. M. Savariaud.—p. 571.
46 Traumatic Deadening of Peripheral Nerves. P. Descouts.—p. 572.
47 Present Status of Treatment of Gonorrhea in the Male. P. Chevallier.—p. 573.

41. **To Overcome Effect of Stiff Ankle.**—Ducroquet gives serial views showing the mechanical principles involved in the disturbance with ankylosis of the ankle joint. It can be corrected in large measure by wearing a heel that brings the foot and leg into an angle of 70 degrees instead of the right angle with the naked foot. The knee and body must be bent to correspond, but this is not enough to attract attention.

44. **Test Tachycardia.**—Aubertin regards as extremely instructive the varying degrees of shortness of breath and acceleration of the heart beat induced by a given muscular exercise and by the change from a reclining to an erect position. The pulse is counted reclining, and again standing. After the exercise, it is counted standing still and reclining again, allowing a given interval between the counts. A number of tracings are given for comparison.

45. **Improvised Mask.**—Savariaud fits a bag of rubber cloth of the mackintosh type loosely over the patient's face. It is held in place by an elastic band, of garter elastic, passing under the chin and over the top of the head. The cloth piece is 50 by 70 cm. in size, and is doubled over and the edges sewed together to make a bag 35 cm. deep. A hole large enough to admit the tip of the finger is made to the right of the nostrils with a counter opening on the other side. The pressure from the elastic band on the suprahyoid region prevents the tongue from dropping back into the throat. The ears show beyond the elastic band, and as long as they are pink and the patient is breathing regularly, all is well.

Progrès Médical, Paris

October 6, XXXII, No. 40, pp. 331-338

48 Shell Shock. H. Damaye.—p. 332.
49 Galyl, a French Substitute for Salvarsan. P. Richard.—p. 334.
50 Standardization of Exercise Tests. B. du Coteau.—p. 337.

October 13, No. 41, pp. 339-346

51 Physostigmin Slows the Pulse Rate. A. Mougeot.—p. 339.
52 Camphor and Sesame Oil in Dermatology. L. Bory.—p. 341.
53 Frame to Aid in Applying Plaster Bandages. H. P. Achard.—p. 342.

Revue de Médecine, Paris

XXXV, No. 3, pp. 133-205

54 *Forms of Epidemic Meningitis with Purpura. A. Netter.—p. 133.
55 *Inflammation of Nerve Roots. (Radiculite cervico-brachiale.) A. Leri.—p. 151.
56 *Acute Insufficiency of Liver and Kidneys. P. Merklen.—p. 172.
57 Scapulohumeral Myopathy in Man of Thirty-One. A. Courjon and J. Chalier.—p. 197.

No. 4, pp. 209-278

58 Can Acute Appendicitis be a Form of Tuberculosis? L. Landouzy.—p. 214.
59 *Influence of Hemorrhages on Glycemia. R. Lépine.—p. 230.
60 The Inorganic Nervous Affections after War Wounds Are the Same as the Hysterotraumatisms of Peace. J. Ferrand.—p. 239. To be continued.

54. **Epidemic Meningitis with Purpura.**—Netter remarks that the peculiar gravity of epidemic meningitis with purpura calls for early intraspinal treatment with a polyvalent serum made from as many strains of meningococci as possible. By this means the mortality in France has been kept down to 24 per cent. while British statistics show a mortality of 60 per cent. The purpura may precede the meningitis, and may even develop without meningeal symptoms at any time. The purpura indicates the generalization of the infection, as the meningococcus is found in the skin lesions and in the blood, and there may be involvement of the joints or myocardium, or iridocyclitis.

55. **Irritation of Spinal Nerve Roots.**—Leri reports in detail four cases in which the pains and loss of cutaneous sensibility stretched along the neck, shoulder and arm, corresponding to the innervation from the cervicobrachial spinal nerve roots. The reflexes in the region were also attenuated or lost entirely, and there was paralysis later, with atrophy of the muscles dependent on the brachial plexus. Syphilis could not be incriminated and there was nothing to suggest tuberculosis or gonorrhea in the four men, but the trouble had commenced with pains in the spine suggesting rheumatism. Leri discovered tender points in the region of the sacrolumbar roots in eighteen or twenty-four cases of ordinary sciatica; in thirteen there was decided lymphocytosis in the cerebrospinal fluid.

56. **Acute Liver-Kidney Insufficiency.**—Merklen gives the details of fifteen cases in which symptoms indicated that the liver and kidneys had suddenly stopped working properly on account of some toxic-infectious influence. In nine cases the disturbances proved rapidly fatal, but in the others the jaundice and uremic symptoms with oliguria and even anuria yielded when copious diuresis was realized, and the men recovered. The condition was much graver to start with than in other forms of infectious jaundice, and estimation of the urea content is the guide to the prognosis. The one thing in treatment is to get the kidneys to working extra freely and keep this up.

59. **Influence of Hemorrhages on Glycemia.**—Lépine relates that a loss of blood corresponding to 1 per cent. of the weight of the animal is almost always followed by hyperglycemia in the healthy animal. Repeated losses of blood may exhaust beyond chance of this recuperating reaction.

Correspondenz-Blatt für Schweizer Aerzte, Basel

October 13, XLVII, No. 41, pp. 1361-1392

61 Reconstruction of the Jaws after War Wounds. (Chirurgisch-zahnärztliche Kieferbehandlung.) H. Matti.—p. 1361. Egger.—p. 1365.
62 *Tumors of the Knee Joint Capsule. J. Züllig.—p. 1368.

62. **Tumors of Knee Capsule.**—Züllig reports a case of giant-cell xanthosarcoma, growing from the synovial membrane of the knee, with a clinically mild course. The patient was a woman of 34 who for ten years had had occasional pains in the right knee with intermissions up to four years. For the last year there had been an effusion at times. It subsided under bed rest and moist heat. The movements of the joint were free, but a movable tumor could be felt close to the patellar ligament. Roentgenoscopy showed the bones normal in the joint but the operation revealed three small tumors in a group and a small fibrous growth, all starting in the synovialis and easily removed. About six months later a fat tissue tumor was removed from the fat tissue around the joint. Histologic examination showed that the first tumors were of the xanthosarcoma type. The patient has had no further disturbance from the knee during the year since. Aside from cases of lipomas, Züllig was able to find only seventeen cases of a tumor of a joint capsule on record. In the eleven sarcoma cases all but three were women. In eight cases the entire capsule was infiltrated with the chondromatous or sarcomatous tissue. In only five of the sarcoma cases was there an isolated tumor. The course was from one to two years except in his case, but in all it was emphasized that there had been no trauma of the knee. The age of the patients ranged from 18 to 39. In one case of small-cell, round-cell sarcoma repeated recurrences required operative measures, and finally the leg was amputated. A myeloid sarcoma in one case has shown no signs of recurrence during the eight years to date. Differential diagnosis is usually by exclusion, the absence of trauma and of pathologic roentgen findings excluding meniscus injury, loose bodies, etc. With round-cell sarcoma, circumscribed excision is not radical enough, but with myeloid and giant-cell sarcomas this seems to be enough under expectant supervision, with repeated roentgen control. Diffuse sarcomatosis and tuberculosis have much in common, but with tumor the use of the knee may be more restricted while, on the other hand, there is not the extreme atrophy of muscles as with tuberculosis. There is little or no pain with sarcomatosis, and no friction sounds as the joint surfaces are intact, and no abscess and fistula production as is liable with a tuberculous knee. Analogous tumors in tendon sheaths are benign; in Spiess' four cases the interval before operation was one, five, twelve and twenty-two years.

Gazzetta degli Ospedali e delle Cliniche, Milan

October 7, XXXVIII, No. 80, pp. 1073-1088

63 *Technic for Exclusion of Pylorus. A. Franchini.—p. 1075.

63. **Exclusion of Pylorus with Strip of Rubber Sponge Tissue.**—Franchini reviews the various technics for exclusion of the pylorus, and expatiates on the superior advantages of a strip of rubber sponge tissue for ligating the pylorus. He uses a strip 16 or 18 mm. wide and 5 or 6 mm. thick, the ends flaring a little to aid in suturing them firm.

Policlinico, Rome

October 14, XXIV, No. 42, pp. 1257-1280

64 *Capillary Drainage for Extensive Wounds. C. Canestro.—p. 1257.
65 Physical Measures in Treatment of Wounds. M. Serena.—p. 1265.
66 *Pernicious Malaria Simulating Tetanus. A. Majoli and F. Paoletti. —p. 1269.

September, Surgical Section No. 9, pp. 353-392

67 *Malignant Papilloma of Maxillary Sinus. G. Bilancioni.—p. 353.
68 Malignant Edema without Gas Production. I. Scalone.—p. 374. To be continued.
69 *Technic for Amputations. G. Lerda.—p. 378. Commenced in No. 7, p. 310.
70 *Tumors of the Mesentery. P. Gilberti.—p. 386.

64. **Capillary Drainage of Wounds.**—Canestro keeps up a constant irrigation of the wound by means of three or more strands of wicking brought down from the irrigator and, after passing through the wound, brought down into a jar below the plane of the wound. This ensures continuous capillary irrigation and drainage. If neutral solution of chlorinated soda is used as the irrigating fluid, the secretions in the wound become thoroughly evacuated by this capillary drainage after a certain time, while the simplicity and ease of this technic commend it. A pad of nonabsorbent cotton is laid over the wound, the skin around protected with gauze impregnated with petrolatum. The nurse can see at a glance by the aspect of the efferent wicks that each is working properly. If the wicking is too short to run the entire distance, the wicking entering the wound and that fitted in its depths and conveying away the secretions can be separate pieces.

66. **Pernicious Malaria Simulating Tetanus.**—The case described emphasizes anew that in a malarial district, whatever the symptoms, the possibility of their being the work of malarial infection alone should never be forgotten.

67. **Malignant Nasal Papilloma.**—The malignant growth involved the right maxillary sinus and half of the nose of a man of 42, and there was recurrence in the lacrimal sac after its apparently successful removal. In another case in a woman of 56 the cancer involved all the right nasal cavities including the lacrimal sac. The microscopic findings are compared with similar cases on record.

69. **Technic for Amputations.**—Lerda here concludes his long study of the indications for different technics with various traumatic lesions with an appeal to save every possible scrap of skin, muscles and tendons. The geometric or esthetic aspect of the stump should be absolutely disregarded, and every effort made to maintain intact and vital all parts of the limb that permit this, when operating close to the firing line. The reduced resisting powers of the tissues and the omnipresent infection impose the necessity for the simplest technic, without attempting to suture. Cinematic amputations, such as Vanghetti has been preaching for twenty years, seeking to utilize the power still left in the stumps of the muscles, forming loops out of them, should be reserved till later. Even with a favorable environment for this complicated surgical work, it is often hampered by the difficulty of finding muscles and tendons long enough to make the loops and cross loops necessary for the purpose, and enough skin to line the tunneled loops.

70. **Ileus from Mesenteric Fibroma.**—Gilberti traces the history of mesenteric cysts back to 1507, but Morgagni in 1760 was the first to report obstruction of the intestine by a mesenteric cyst. In a personal case described, the pure fibroma had not caused any appreciable symptoms until suddenly obstruction of the intestines produced a severe set of disturbances. Probably some unusual accumulation of feces or gas had combined with the movable tumor to occlude the passage. There was no suspicion of the exact cause of the ileus until the operation revealed the mesenteric site of the tumor. The latter had been discovered several months before, immediately after an abdominal contusion.

Riforma Medica, Naples

September 22, XXXIII, No. 38, pp. 913-932

71 Mixed Intravenous Vaccination against the Typhoid Group. G. Quarelli.—p. 913.
72 Regeneration of External Popliteal Nerve after War Wound. C. Ceni and V. Desogus.—p. 915.
73 *Unintentional Muscular Movements and Contractures after War Wounds. S. Ricca.—p. 918.
74 Etiology of Sprue. (Psilosi.) G. A. Moscati.—p. 922.

October 6, No. 40, pp. 953-972

75 Five-Day Fever in Italian Soldiers. P. Sisto.—p. 953.
76 Present Status of Treatment of War Wounds of Peripheral Nerves. G. Moscati.—p. 959.

73. **Parakinesia after War Wounds.**—Ricca applies this term to deviation from normal of the volitional motor functioning of certain groups of muscles after healing of a war wound. He cites a number of examples of these unintentional by-movements, and emphasizes the importance of breaking up these bad habits as soon as they show themselves. Once well established, the parakinesia may prove quite rebellious. Treatment is by training, with the usual measures for overcoming a tendency to tics of any kind.

Tumori, Rome

June-September, V, No. 3, pp. 229-356

77 *Experiences with Rat Sarcomas. G. Serafini.—p. 229.
78 *Preceding Injury of Tissues as a Factor in Development of Experimental Tumors. G. Fichera.—p. 258.
79 *Bone Metastasis of Hypernephroma. G. D'Agata.—p. 272.
80 *The Anatomic Findings and Outcome after Resection of the Stomach. G. Fichera.—p. 305. Continuation.

77. **Rat Sarcomas.**—Serafini relates that in resecting part of the spleen in a patient with malignant disease of the spleen, he was obliged to resect the splenic artery. Two years have passed to date without a sign of recurrence. This suggested that possibly the shutting off of the splenic vessels was responsible for the unexpectedly favorable outcome. But a long series of experiments on rats refuted this assumption, these rats dying rather sooner than the controls. Other factors must have been responsible in the clinical case mentioned. Further experiences on rats immunized with repeated small injections of spleen tissue or sterilized sarcoma tissue, either promoted the growth of the malignant tumor or had no effect. Injection into the tumors of an emulsion of lecithin seemed to sensitize the growths to the action of the roentgen rays. The sarcomas also showed a moderate inhibition of growth after treatment with rat serum that had been exposed in vitro to the action of the radium rays. But fragments of sarcoma exposed to radium seemed to give prompter and larger growths when the rats were inoculated with them than when the scraps had been exposed to roentgen rays. Inoculation of sarcoma tissue directly into the knee never induced a sarcoma at this point.

78. **Preceding Injury of Tissues as Factor in Development of Experimental Tumors.**—Fichera protests against the conclusions drawn by Pentimalli from a series of negative experiences in this line.

79. **Metastasis of Hypernephroma.**—D'Agata's patient was a man of 56 who six months before had noticed a bunch in the parietal bone. Indolent at first, during the last month it had increased in size until it was as large as a hen's egg. The tumor excised was of the suprarenal type of tissue, and D'Agata reviews the literature on the subject of hypernephromas and their metastasis in bones. This latter usually occurs between the ages of 40 and 60; only one case is cited in a younger woman. It has usually been diagnosed as a tuberculous affection until the microscope revealed its true character. The discovery of multiple tumors in an adult should always suggest the possibility of metastasis from hypernephroma; Albrecht advises a lumbar exploratory operation on this basis alone. The bone metastasis may precede clinical manifestations of the primary tumor, as in the case reported. D'Agata not only advises extirpation of the metastasis but insists that the primary tumor should be sought and removed and its site given roentgen exposures. Removal of the bone metastasis alone does not seem to have improved the prognosis in any of the cases on record, the primary tumor continuing its malignant course unmodified.

80. **Resection of the Stomach.**—In this instalment of his monograph, Fichera gives the operative findings and the outcome years later in six cases of gastric ulcer and forty-nine of gastric cancer.

Brazil-Medico, Rio de Janeiro

September 15, XXXI, No. 37, pp. 313-320

81 *Mycosis of the Lungs from the Brazilian Oidium. IV. O. Magalhães.—p. 313.
82 Orthopedic Treatment in Little's Disease. A. F. de Magalhães. —p. 316. Commenced in No. 36, p. 306.

September 22, No. 38, pp. 321-328

83 Myxosporidium of Brazilian Fishes. A. M. da Cunha and O. da Fonseca.—p. 321.
84 Ancient and Modern Views of Syphilis. D. Speroni.—p. 325.

September 29, No. 39, pp. 329-336

85 *Spirochete of Hemorrhagic Jaundice in Rats at Rio. H. de B. Aragão.—p. 329.
86 *Suppuration in the Urinary Apparatus of Infants. N. Gurgel.—p. 330. Commenced in No. 38, p. 321.

81. **Pulmonary Mycosis.**—Magalhães relates that a young man developed mycosis of the lungs, fatal in a little over thirty days, and he knows of three other cases with a similar acute course. In some of the chronic cases he has encountered, the affection flared up into an acute phase, promptly fatal in more than one case. Left untreated, this pulmonary oidiosis is always fatal. The temperature curve is characteristically irregular, and there are signs of softening and breaking down of the parenchyma in the lung. Treatment with potassium iodid is decisive. The septicemia is alike in man and animals. The rabbit is as susceptible to inoculation with the oidium as the guinea-pig to tuberculosis. In macacus monkeys the oidium penetrated the intact mucosa of the mouth and nose.

85. **Spirochete in Rio Rats.**—Aragão reports finding in rats at Rio de Janeiro the spirochete described by Inada and Ito as the *Spirochaeta icterohemorrhagiae*, by the Germans as the nodose spirochete, and by Noguchi as the *Leptospira icterohemorrhagiae*. Kidney tissue from the rats was injected into six guinea-pigs, and one died the tenth day with intense jaundice and hemorrhagic foci in lungs and stomach, epistaxis and edema. Emulsions of liver and blood from this guinea-pig reproduced the same disease when inoculated into six others. Clinical cases of infectious jaundice have been described recently in northern Brazil, but the source of the infection could not be discovered in suspected human beings. The discovery of the spirochete in rats at Rio throws more light on the subject.

86. **Suppuration in Infant's Urinary Apparatus.**—Gurgel remarks that the infant's yellowish pallor and restlessness are the first symptoms that call the parent's attention to the trouble. The mucous membranes are blanched, and the child has no desire to eat. With fever in an infant the ear and the urine should be examined at once, but in practice very few take the trouble to examine the urine. He declares it is as important for the infant as for the adult. If not obtainable otherwise, he draws some urine with a catheter. In about 40 per cent. of the cases of fever in infants for which no cause is manifest, pyelitis is responsible, and in about 95 or 98 per cent. of the nontuberculous cases the colon bacillus is found. In the majority of cases the infection of bladder or kidneys has spread from the bowels, possibly by way of the lymphatics. In his experience there was usually a preceding influenza, measles or tonsillitis, and, in one case, paratyphoid infection; in all there was a history of intestinal upset. The pyelitis or pyocystitis generally develops insidiously and runs a protracted course. Left untreated, serious damage may result while the course is benign when the pyuria is discovered early and treatment applied at once. He has obtained excellent results in treatment of pyelitis in infants with methylene blue alone, injecting it into the rectum in a 1, 2 or 3 per thousand solution, twice a day. It generally is eliminated in from thirty to ninety minutes. In three or four days the fever drops and the pus disappears from the urine. The child cannot be deemed cured until repeated examination at varying intervals confirms the absence of pus from the urine. He reports eight cases in detail. In some cases, salol also was given, but the results were equally good with the methylene blue alone. In another case the *Bacillus lactis-aerogenes* was cultivated from the urine, and it induced in guinea-pigs congestion of the intestines and hemorrhages in the omentum.

Semana Medica, Buenos Aires

August 30, XXIV, No. 35, pp. 247-270

87 Edematous or Hydremic Form of Disturbance from Too Exclusive Carbohydrate Feeding of Infants. M. Acuña.—p. 247.
88 Treatment of Ankylosis. E. M. Olivieri.—p. 253. Continuation.
89 The Public Hospitals, Asylums, etc. of Buenos Aires. E. R. Coni.—p. 259. Continuation.
90 Vaccine Therapy of Gonorrheal Conjunctivitis in Adults. J. C. Mira.—p. 264.

September 6, No. 36, pp. 271-302

91 *Plantar Tibialis Anticus Reflex. J. M. Obarrio.—p. 273.
92 The State Colony for the Feebleminded. A. Chueco.—p. 274.
93 Present Status of Treatment of Typhoid. P. V. Cernadas.—p. 279.
94 The Fight against Tuberculosis in Argentina. E. R. Coni.—p. 288.

91. **Plantar Tibialis Reflex.**—Obarrio gives an illustration showing the dorsal flexion, adduction and inward rotation of the foot when the plantar reflex was elicited in a woman with spastic paralysis, negative Babinski, Gordon, Schaffer and Oppenheim signs, while the Strümpell was positive. The muscle showing the reflex action was the tibialis anticus. He has encountered it also in other cases of organic lesions with negative Babinski.

Siglo Medico, Madrid

September 29, LXIV, No. 3329, pp. 725-744

95 Further Research on the Blood with Vital Staining. F. Mas y Magro.—p. 726.
96 Technic for Salvarsanized and Mercurialized Serum in Intraspinal Injections. F. Escudé.—p. 730.
97 Medical Precepts and Prejudices on Diet Questions. S. Baglioni. —p. 734. To be continued.

October 6, No. 3330, pp. 745-764

98 Lesions in Joint Ligaments. S. G. Hurtado.—p. 749.
99 Diet Questions. S. Baglioni.—p. 753. Continuation.
100 Psoriasis. Sicilia.—p. 755.

October 13, No. 3331, pp. 765-784

101 Typhus at Madrid in 1916. G. Marañon.—p. 766.
102 *Suction Extraction of Cataract. J. A. and I. Barraquer (Barcelona).—p. 768. Commenced in No. 3330, p. 746.
103 Means to Reduce Infant Mortality. B. H. Briz.—p. 771.
104 Paroxysmal Tachycardia with Hydatidiform Mole. P. L. Marcos. —p. 773.

102. **Suction Extraction of Cataract.**—Barraquer's success in extracting cataract in the capsule by vacuum suction has been mentioned in THE JOURNAL (June 9, 1917, p. 1789). He here gives a historical review of cataract operations, with illustrations showing the Daviel and Smith technics and his own method. The latter does not require any pressure but merely draws the lens out in toto by vacuum suction through a shallow cup applied to the lens. He also gives illustrations of different apparatus for inducing the vacuum by electricity or a water jet pump. The cataract extractor itself projects from a syringe-like instrument held in the hand like a pen, the thumb controling a valve that shuts off the suction at will. He dilates the pupil with cocain and epinephrin an hour beforehand. This permits the use of eserin, and hernia of the iris is warded off.

Gann, Tokyo

October, XI, No. 3, German and English Department, pp. 27-46

105 *Gastric Tumors in Rabbits Fed with Wool-Fat. Y. Kon.—p. 27.
106 *Hen Sarcoma. T. Ogata and M. Ishibashi.—p. 32.
107 Sarcoma in Mouse Thymus. K. Ichikawa.—p. 34.
108 Fate of Tumor Cells in Blood Stream. M. Takeuchi.—p. 36.
109 *Tumor of Horse Testicle. T. Kimura.—p. 38.

105. **Abnormal Proliferation of Gastric Mucosa after Feeding with Wool-Fat.**—Kon fed rabbits and rats for six months or more with adeps lanae hydrosus, the rabbits taking a daily total of from 5 to 10 gm. with their vegetables. In 50 per cent. nodules developed and adenomatous proliferation in the pylorus region where the lipoid had accumulated. The range of proliferation was wide, one rabbit presenting an enormous adenoma while another under the same conditions had only a minute lump, but in this rabbit there was a tubular adenoma in the liver with considerable lipoidosis. The tongue, gums and lips also displayed a similar tendency to papillomatous proliferation, and there was also in some a tendency to

deposits of lipoid in the skin and falling of the hair. Two plates accompany the article.

106. **Chicken Sarcoma.**—Ogata and Ishibashi report that they injected subcutaneously in sixty-eight young hens blood serum from hens with one of the three types of sarcoma (the Fujinami, Hayashi and Rous strains). One of the hens injected developed a tumor. It was of the Rous' chondrosarcoma strain. The possibility of thus inducing a secondary tumor seems to be established, thus confirming Busch's similar experience in this line, published in 1914. They warn, however, that as we know of the possibility of blood-borne metastasis, a similar mechanism might explain the secondary tumor growth in this exceptional case. They call attention further to the adsorbing power of kaolin and animal charcoal in respect to tumor virus. When added to a well diluted emulsion of tumor tissue and the whole vigorously shaken up, and then filtered or centrifuged, the filtrate or supernatant fluid never induced tumor growth when injected subcutaneously into hens. On the other hand, the sediment and filter residue proved extremely virulent when injected. By this simple means we have it within our power to materially enrich the tumor-producing substance contained in serum or other fluid mediums.

109. **Testicle Tumors in the Horse.**—Kimura states that veterinarians found 142 tumors of various kinds among 77,224 horses killed in Japan during the last eight years; fifteen in 241,187 cattle, and three in 477,772 hogs. In the horses there were nine cases of tumor in the lung, malignant in all but one; four in the stomach; one in the uterus; forty-nine in the testicles; eight in the kidney; fifty-three instances of melanoma, and fourteen of sarcoma, seat unknown. The various data are tabulated and compared with similar data from European literature. He gives plates showing the microscopic findings in twelve cases of orchidoma or orchidoblastoma in horses—all of the epithelioma type. There were signs of metastasis in six. The horses affected were mostly stallions, 15 years old or over.

Russkiy Vrach, Petrograd

XVI, No. 18-20, pp. 385-408

110 *Acute Edema of the Lungs. N. A. Kruglevsky.—p. 385.
111 *Treatment of Poisoning from Asphyxiating Gases. V. N. Boldireff. —p. 390.
112 *Behavior of the Vegetative Nervous System during Poisoning from Asphyxiating Gases. N. I. Leporsky.—p. 391.
113 *The Nervous Manifestations with Poisoning from Asphyxiating Gases. M. N. Neiding.—p. 397.
114 *The Nervous and Psychic Condition with Poisoning from Asphyxiating Gases. M. Y. Sereisky.—p. 401.
115 *Intravenous Injections of Oxygen in Treatment of Poisoning from Asphyxiating Gases. K. F. Gakh.—p. 403.

110. **Mechanism of Acute Edema of the Lungs from Poisoning with Asphyxiating Gases.**—Kruglevsky analyzes the literature on the subject of acute edema of the lungs, citing in particular the views of Yandell Henderson and Martin Fischer on the mechanism of its origin. The old assumption of capillary pressure, as explaining acute edema of the lungs, failed to take into account the conditions of the natural pulmonary circulation, and hence experimental research in this line was based on inadequate premises. Further light has been thrown on the subject by the sudden poisoning from war drift gases as he explains in detail. Edema of the lungs occurs so rapidly that it reaches its height before inflammation has had a chance to develop.

111. **Treatment of Poisoning from Asphyxiating Gases in War.**—Boldireff urges among other points in treatment that the clothing of the gassed men should all be removed and fresh put on at once, changing even the shoes, as they all hold gas. In moving and in transportation of the gassed men, extreme care is imperative to keep them from jolting and from impure air. Absolute bed rest is imperative, not even allowing them to sit up, for three or five days at least. Talking and smoking should be prohibited, and no smoking should be allowed in their vicinity. As so much of the lungs has been damaged by the gas, the air the men breathe must be uncontaminated. The gassed are peculiarly sensitive to cold, and they must be kept warm and well covered. Fluids must be supplied to the body freely by various means to dilute the over concentrated blood. Revulsion to the chest, dry or wet cupping or mustard pastes are indispensable, especially when there are signs of incipient edema of the lungs. General venesection is not recommended, and there must be no rubbing of the patient to warm him, as this is liable to induce embolism. Among the tonics found useful have been subcutaneous injections of ether, camphor or atropin, and a few drops of anisated solution of ammonia by the mouth. Strophanthin seems the best heart tonic when one is directly indicated, as this drug acts quickly and does not constrict the vessels. In sectors especially exposed to drift gas attacks, ample supplies of extra clothing, gas masks, and everything needed to combat the gases should be kept on hand, not only for the troops but for the civilian population in the gassed region. Last year, he adds, many children were killed by the asphyxiating drift gases. He warns in conclusion that it is often difficult to differentiate poisoning from this source when the circumstances are not known, and he urges close study of the cases for further differential points.

112. **Behavior of the Vegetative Nervous System in the Gassed.**—Leporsky records the reaction to atropin of forty gassed soldiers, and further the reaction to epinephrin and to pilocarpin. The findings with each are tabulated and compared. The responses in the majority indicated vagotony to a greater or less degree. In some cases, however, there seemed to be dissociation; some parts of the vegetative nervous system showed increased and other parts lowered tonus. The asphyxia from the gas poisoning evidently starts the centers in the oblongata to extra functioning, and this in turn deranges the functioning of the glands with internal secretions.

113. **Nervous Manifestations in the Gassed.**—Neiding states that in his 274 cases of poisoning from drift gases there were ninety-six men who showed no symptoms on the part of the nervous system and forty-six with only one, but in 132 there were indications of pronounced involvement of the nervous system, loss or modification of the reflexes and analgesia. Some of the others showed dermographism, irregular and rapid pulse or respiration, or other signs of nervous disorder, as with a traumatic neurosis. Over 50 per cent. of the 274 men thus presented objective nervous manifestations. Some are evidently traceable to direct anatomic injury of nerve tissue from chemicals in the gases.

114. **The Nervous-Psychic Condition in the Gassed.**—Sereisky reviews sixty cases of poisoning from gas attacks, and discusses in particular the nervous and mental condition of seven reaching his service six or eight weeks later. The symptoms indicate, he reiterates, that the gases contain some substance or substances which have a direct toxic action on nerve tissue. Inherited nervous taints render the nerve tissue peculiarly susceptible to the action of this toxic substance.

115. **Oxygen Intravenously in Treatment of Poisoning from Asphyxiating Gases.**—Gakh has only two cases to report in this preliminary communication, but he affirms that the success was striking in both, although as the patients were moribund at the time the benefit was only transient. The symptoms of the gassed show that the organism is perishing for lack of oxygen which the lungs are unable to take up from the air. The experiences with artificial pneumothorax show that a gas can be introduced into the body in large amounts without danger. Gakh's tests seem to demonstrate that oxygen introduced cautiously into a vein is absorbed so rapidly that embolism need not be feared. He injected it with the technic as for artificial pneumothorax, using a morphin needle to introduce the gas into the ulnar vein. All proceeded smoothly in the two cases described, as was anticipated from the theoretical and physiologic premises.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

September 8, II, No. 10, pp. 831-926

116 *Tests of Visual Acuity; the Separable Minimum. C. O. Roelofs. —p. 836.
117 *Peas in Treatment of Deficiency Diseases. D. J. H. Pol.—p. 850.
118 Tuberculosis in the Netherlands. C. A. Cammaert.—p. 856.
119 *Radiology in Gynecology. B. J. Kouwer.—p. 861.
120 Intradural and Extradural Tumor; Two Cases. H. W. Stenvers. —p. 863.

116. **The Separable Minimum in Testing Vision.**—Roelofs describes with a number of plates his research on the smallest space between two dots or lines that can be perceived by the eye. He discusses further how to estimate and record this separable minimum or Auslösungsvermögen, as Hering calls this limit of separate perception.

117. **Peas in Treatment of Deficiency Diseases.**—Holst in Norway found a few years ago that the Norwegian gray pea seemed to be effectual in curing ship beriberi. A trial of these peas (*capucijners*) in the Netherlands West Indies showed that they were effectual also in curing Asiatic beriberi, but Pol states that the action of katjang hidjoe, better known as the *Phascolus radiatus*, of the bean family, is more powerful. These experiences confirmed the deficiency in vitamins as responsible for the symptoms in both these diseases, although the ship beriberi never develops in the acute form sometimes observed with the Asiatic type. With the former, edema gradually extending upward from the ankles is more common than paralysis, and proper food arrests the trouble at once. The European land type of beriberi usually runs a subacute course, and there is always paresis with or without slight edema. Pol reports in detail a case of this kind in a previously healthy man with three healthy children. He developed ascending paresis which gradually became actual paralysis within five or six months. Even the organ of speech was involved, so that speaking fatigued him; the arms and legs were quite paralyzed. By the sixth month the paralysis was apparently grave until the possibility of the trouble being a deficiency disease was suggested, and the diet was changed to include peas and phaseolus. As the supply of the latter soon gave out, the peas were the main reliance. They were given cooked and also in the form of a decoction, of 2 kg. boiled down to 1 liter, added to his usual food. No benefit was apparent for seventeen days, but then the paralysis began to subside, and in two weeks the paralysis of the legs had disappeared, the improvement continuing to progress in arms, hands and around the mouth in turn, the tongue being the last to return to normal. Fortunately, the long interval before improvement began had not discouraged either physician or patient. When improvement began it was rapid for a while and then subsided into a slow and gradual phase of improvement, corresponding to recuperation of the actually degenerated nerve cells. Traces of paresis were still evident by the eighth month, but there is every reason to suppose that complete recovery will follow in time. The man was a sergeant instructor of the fortress artillery and had to work in water part of the time.

119. **Roentgenotherapy in Gynecology.**—Kouwer warns that roentgenotherapy for fibroma of the uterus is still in the tentative stage. Opinions are still divided as to whether the fibroma itself or the ovaries should be exposed. He warns further that our assumption as to the two separate functions of the ovary—the production of the ovum and of the internal secretion—is still purely hypothetical. But we have reason to assume that roentgen exposures carried far enough are equivalent to castration, and we do not know the damage that may be wrought by the exposures even stopping considerably short of this. Instances have come to his knowlege in which roentgenotherapy has been applied to young women to relieve dysmenorrhea, and even women of 35 and 40 are not excluded from roentgenotherapy by those who fail to appreciate the power of the roentgen rays acting in this region. The gynecologists have not failed to warn of the dangers from operations, and the majority refrain on principle from operating for uterine fibroma unless very serious indications call for it. But, he adds, the roentgenologists are not equally frank in regard to dangers from roentgenotherapy. The medical literature in the Netherlands has no reports of injury of patients from roentgen treatment. He knows that such cases exist, but where are the reports of them? In referring to the Freiburg method of abrupt and very powerful application of the rays, he says that it is not difficult to learn from the very reports of their 1,395 cases sent out by the Freiburg clinic the harm done in this or that case. "How does it happen," he exclaims, "that Freiburg is deaf and blind to them? How can it be explained that, nevertheless, the statements of König and Gauss are accepted by many as absolute authority?"

Hospitalstidende, Copehagen

September 19, LX, No. 38, pp. 909-932

121 *Treatment of Diabetes Insipidus. A. Norgaard.—p. 909. Commenced in No. 37, p. 885.

121. **Treatment of Diabetes Insipidus.**—Norgaard discusses the present status of our knowledge in regard to diabetes insipidus, and the literature, and then devotes over thirty-two pages to the detailed description of a case as influenced by treatment of different kinds over long periods.

Hygiea, Stockholm

September 15, LXXIX, No. 17, pp. 865-912

122 *Experiences with Carrel Treatment of Suppurative Processes. K. Gramen.—p. 865.
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124 *Thrombosis and Embolism of Mesenteric Vessels. J. A. Hedlund. —p. 875.
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122. **Carrel Treatment of the Suppurating Processes of Peace.**—Gramen applied the Carrel method first in a case in which the leg had been run over by a freight car. While waiting for the shock to subside to permit amputation, a trace of warmth was detected in the foot and conservative measures were applied, but in the course of six weeks the ulceration and necrosis had become so extensive that amputation seemed finally inevitable. The leg was then treated by the Carrel method, and in two days there was marked improvement and the lesions began to heal rapidly. The man is now walking with crutches, the leg 30 cm. shorter than its mate. In other cases of extensive suppurating processes, healing was more rapid and complete than under the ordinary measures. The method has been applied in several hundred cases at the Stockholm Hospital, and the general impression was equally favorable, but occasionally cases were encountered which did no better with this than with other methods. In thirteen cases of appendicitis, cholecystitis or salpingitis, a combination of the Carrel technic with the Mikulicz tampon gave excellent results, placing the Carrel drains inside the sack and tamponing around them. Warming the Dakin fluid to 37 C. seemed to reduce its strength about 0.007 per cent. per day. Patients with burns of the third degree complained of pain from the fluid. In one case of total streptococcus empyema, requiring rib resection, the collapsed lung showed no tendency to expand, but after secondary suture under Carrel treatment, healing proceeded by primary intention and the pneumothorax was gradually absorbed.

124. **Thrombosis and Embolism in Mesenteric Vessels.**—Hedlund has compiled about 373 cases of thrombosis and embolism of the mesenteric vessels, and reports two additional cases from his own experience, both fatal, in women of 40 and 59. The cases on record were nearly all in persons over 36; all but 38 per cent. were in men. In 6 per cent. both arteries and veins were involved; in 50 per cent. the arteries alone. Endocarditis and endarteritis are the usual causes, and some recent serious sickness, such as pneumonia, is common in the antecedents. The clinical picture may set in with bloody diarrhea or symptoms of ileus, with remittent attacks of pain, vomiting, sweats, violent localized peristalsis or paralytic ileus; collapse soon follows, with gangrene of the bowel and peritonitis. In one of his two personal cases there was gangrene from anemia, in the other hemorrhagic infarction, but the clinical picture in both was that of ileus. The course may be briefly fatal or it may drag along for months, the colic-like pain returning about thirty or sixty minutes after a meal, and lasting for from two to four hours, without localized peristalsis or stiffening of the bowel. In one of Hedlund's cases the trouble began with a chronic course, not flaring up into the acute phase until after about nine months.

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127 Radical Treatment of Abortion in the Home. A. G. Lauritzen. —p. 1671.